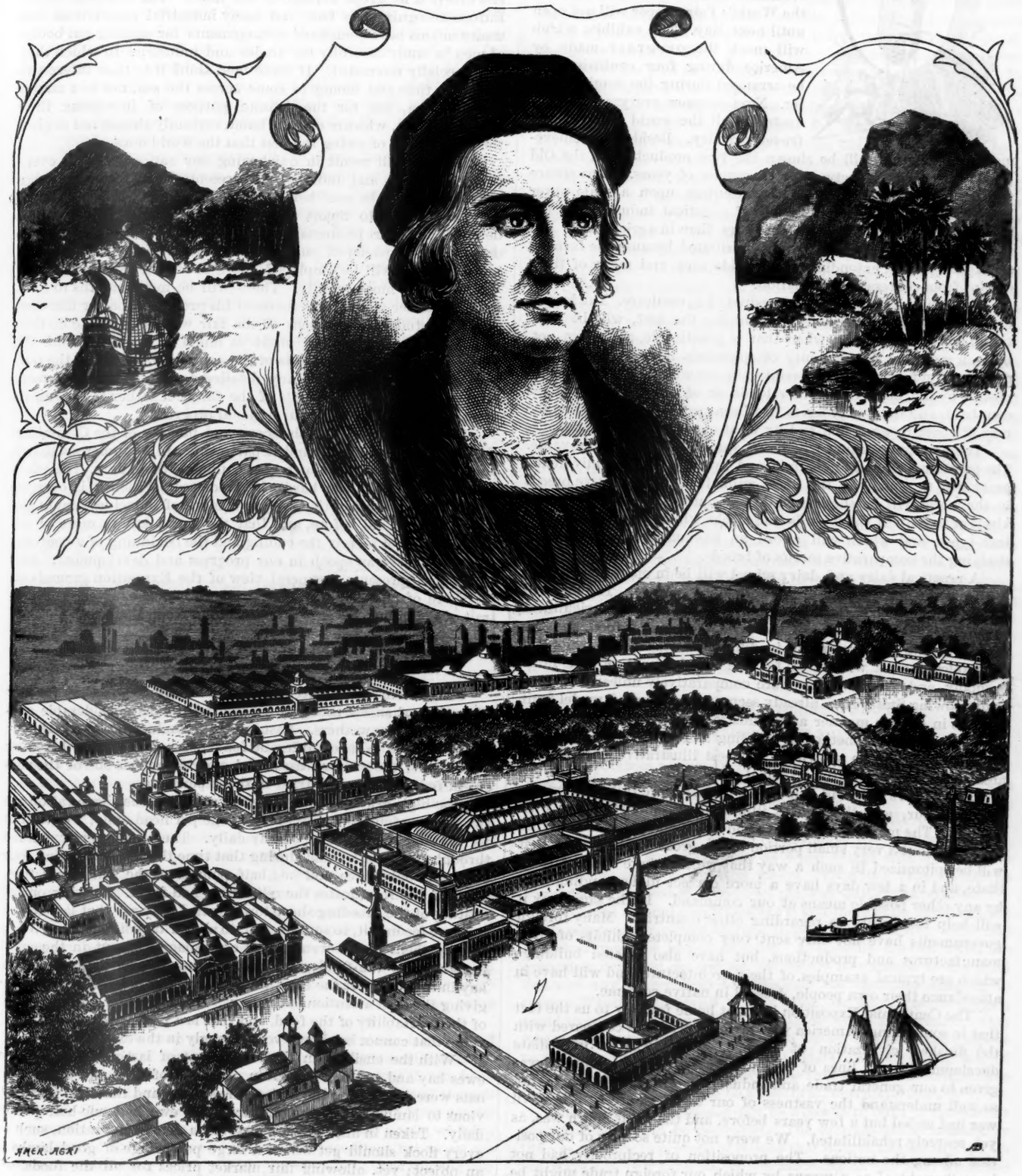
AMERICAN AGRICULTURIST

FOR THE

FARM · GARDEN · & · HOUSEHOLD

"AGRICULTURE IS THE MOST HEALTHFUL, MOST USEFUL, AND MOST NOBLE EMPLOYMENT OF MAN."—WASHINGTON.

VOLUME LI.—No. 10. NEW YORK, OCTOBER, 1892. NEW SERIES—No. 549.



COLUMBUS, AND THE WORLD'S COLUMBIAN EXPOSITION.

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THE WORLD'S FAIR AT CHICAGO.

N the shore of Lake Michigan, in the midst of the farms of America, the Columbian Exposition will be formally opened at Chicago during the month of October to celebrate the four hundredth anniversary of the landing of Columbus upon the soil of the New World. In order that a creditable exhibition may be insured, the World's Fair proper will not open until next May. The exhibits which will mark the progress made by America during four centuries will be arranged during the coming winter. Next summer every art and industry of all the world will meet in friendly rivalry. Beside the achievements of America will be shown the ripe products that the Old World has been perfecting for thousands of years. Agriculture will occupy a space and hold the attention upon a scale never before attempted. In no branch of practical industry has the world been moving faster, of late years, than in agriculture. But the movement has not been evenly distributed because the farmers are a vast people, extending over a wide area, and many of them distant from centers of information.

Here will be grouped every product of agriculture. The best of everything, and the method of producing the best, will be illustrated by object lessons, when that is practicable, and when not, by such means as the ingenuity of specialists in every branch can devise. The farmer will be enabled to see what has been accomplished by the farmers of other lands, or of other sections of his own land, and if their progress has been greater than his own, he may discover in what line and by what means progress was made.

The live stock exhibit will be of special excellence and value. The premiums offered by the fair, and by societies and individuals, make sure that many of the finest animals of the respective breeds in the world will be shown, while associations of breeders of all kinds of stock will show herds and flocks which will represent the best types, and which will afford an unequaled opportunity for studying the comparative merits of breeds.

A practical dairy and dairy school will be in operation to fully illustrate the most recent progress in dairy science. The fair will teach us much about the manufacture of many other agricultural products. The preparation of the various grains for food, and the curing, drying and preserving in different ways of our fruits and vegetables open a wide field for the development of our farm economy, and one in which we are comparatively unlearned. Our fruit growing States have already secured and planted model fruit gardens in such a manner as to illustrate their best horticultural productions and the method of planting and cultivating. In each State exhibit, will be shown by the best illustrative methods, the area and production of the principal crops.

The World's Fair will help us to realize more fully the extent, the grandeur, and the almost illimitable resources of our own country. The majority of us have had the opportunity of studying personally but a very small portion of our great territory. Here it will be epitomized in such a way that we may take it up State by State, and in a few days have a more correct understanding than by any other possible means at our command. In the same way it will help to educate us regarding other countries. Many foreign governments have not only sent very complete exhibits of their manufactures and productions, but have also erected buildings which are typical examples of their architecture, and will have in attendance their own people, dressed in native costume.

The Centennial Exposition brought home forcibly to us the fact that in some things America was raw and crude, as compared with the finished civilization of Europe. There was an immediate development in all lines of decorative art, and some stimulus was given to our general trade and industries. But in 1876 we did not so well understand the vastness of our own resources. The civil war had ended but a few years before, and the great South was, as yet, scarcely rehabilitated. We were not quite so sure of our position among the nations. The proposition of reciprocity had not been thought of as a means by which our foreign trade might be established upon a sure foundation. That remarkable development of the Missouri valley, by which we have been enabled to flood the markets of the world with grain and meat, was only well begun. Strikingly as the Centennial illustrated the great progress of the nation during the first one hundred years of its existence, a comparison between that and the present exhibition will afford a still more marvelous lesson. In many things we have made greater progress during the less than a score of later years than in the whole century that went before.

Many of us who live quiet and retired lives are not fully awake to this astounding fact. To such the fair will open a new world, and we hope that all our readers will have an opportunity to visit it, because every man is able to live with better profit to himself and others if he keeps abreast of the times. The working men of Europe recognize this fact, and many industrial associations and trades unions have completed arrangements for sending out bodies of men to study carefully the trades and industries in which they are especially interested. If these men think it to their interest to spend the time and money to come across the sea, not as a matter of recreation, but for the definite purpose of increasing their knowledge, we, who are close at hand, certainly should not neglect the opportunity of seeing the best that the world does.

The fair will result in quickening our national life in every artery of trade and industry. Representatives of every foreign government will be sent here, and each will find some matter of especial interest to report upon, which will result in an added demand for our products and manufactures. To meet these demands the capacity of our mills and factories will be increased, more laborers will be employed, more raw material used, money will circulate more rapidly. There will be more mouths to feed, and the farmer will need to increase his producing power likewise. A careful study of the lessons of the fair will help him to do this, so that he may expect to profit as much as others by both the teachings and the after results of the exhibition. It is not the purpose of this article to give any detailed description, or even mention, of the many departments of the fair, but rather to suggest its actual value as a factor in our national progress.

This is but a glance at the scope and purpose of the Columbian Exposition. Its divisions and departments are so numerous that it would exhaust our space merely to catalogue them here. The effect upon us as a nation can hardly be predicted. When it is over we shall awake to the fact that we know more of ourselves and of the world than we did before, and that the world knows more of us. It will mark not merely the ending and the beginning of a century, but it will mark an epoch in our progress and development. Our frontispiece presents a general view of the Exposition grounds on the shore of Lake Michigan, in southern Chicago. Near the portrait of Columbus, his ship is approaching tropical shores.

SILAGE FOR SHEEP.

J. A. CRAIG, WISCONSIN AGRICULTURAL EXPERIMENT STATION.

Silage seems to be better suited for breeding ewes than for any other class of sheep, though we have fed it with considerable success to fattening wethers. Last winter I conducted an experiment on the relative value of different fodders for maintaining breeding ewes during the winter season, and corn silage was one of the succulent fodders that were tried in the experiment.

The high grade Shropshire ewes receiving the silage ration ate two and one-fourth pounds of the silage per head daily. With that we fed about one pound of hay daily. The experiment extended through two months, and during that time the lot, containing four ewes, left only three and one-half pounds of the silage as refuse. That, of itself, indicates the relish they had for it. Bearing on the attitude of the breeding sheep towards it, I may say that last spring we were feeding it, to some extent, to all our breeding flock. When feeding them in the evening, the corn silage was put in the small trough below the fodder rack. Even though we put good clover hay in the rack, yet the ewes would eat nearly all the silage before giving the least attention to the hay. This I consider good evidence of the palatability of the food, and that is a practical factor of great value that cannot be shown very strongly in the experiment.

With the ensilage in the experiment of last year, we fed the ewes hay and grain. The grain consisted of bran and oats. The oats were fed during the first of the season, and the bran just previous to lambing. Of the mixture, each ewe had one-half pound daily. Taken in all, the ewes received a nourishing ration, such as every flock should get where a large percentage of good lambs is an object; yet, allowing fair market prices for all the foods, we were able to keep these breeding ewes on the silage ration at a daily cost of one cent and one mill per head. The ewes at all times appeared thrifty. Though I closely followed the sheep through the

experiment, I could not detect any injurious results from feeding the silage. I know it had a good influence on the thriftiness of the sheep, and the practical shepherd knows that to be a sufficient recommendation. I am inclined to believe that the feeding of the ensilage had a good effect on the flow of milk after lambing, but I am prevented from being certain, owing to the fact that the individuality of the ewes is an element in the question forbidding the drawing of such a conclusion. The silage used was good and moderately acid, just such as may be made on any farm.

We have tried corn silage in a ration containing other foods for fattening wethers, and it has given fair satisfaction, but I cannot speak of it so strongly for this purpose as for breeding ewes. Last year we fed six wethers a ration containing corn silage, cut corn fodder and whole corn, and, during the three months, so fed, they gained 181 pounds, and this was made at a cost of $3.70 per 100 pounds. This, however, does not indicate the profit made by these sheep, for each pound of gain, that was made, added considerably to the value of every other pound that they weighed before we began to fatten them.

The silage ration is about as cheap as one may hope to make a fattening ration for wethers. During a brief period of the experiment the wethers did not relish the silage. This incident, though it did not very materially affect the progress of the wethers, was the only feature of the experiment that was against the silage. For fattening sheep it is not likely that silage can fully take the place of good turnips. A mistake has been made in relying too much on silage alone in feeding it to stock. I am satisfied, if fed to breeding ewes in quantities too great, without much of any fodder, it would produce results very similar to those from feeding heavily with roots, as there would be many weak, and some dead, lambs.

CROSSING AND HYRRIDIZING FRUITS AND SHRUBS.

PROF. J. L. BUDD, IOWA EXPERIMENT STATION.

On the grounds of the Iowa Agricultural College an attempt is being made to improve cultivated fruits and ornamental shrubs by systematic cross fertilization. We have a good opportunity for doing some valuable work in this line if many of the conclusions reached by Darwin in his work on cross fertilization are well founded.

We have in heavy bearing many varieties of apples from Eastern Europe which a test of fourteen years over a vast area of the Northwest has demonstrated to be as hardy, or hardier, than the Oldenburg. A number of these varieties are early and continued bearers of large, finely colored, and from good to very good quality with varied season of ripening ranging from Early Harvest to midwinter at Ames, and later farther north. Our purpose in crossing is to improve the quality and keeping capacity of the fruit, and yet to retain in large part the hardiness of wood and perfection of foliage of the mother varieties.

During the past six years we have made many crosses on these ironclad sorts, with pollen of such select winter sorts as Northern Spy, Rhode Island Greening, Jonathan, Grimes' Golden, Rawles' Janet and Osceola. The resulting seedlings in every case we have found about as hardy as the mother plants, as tested on the college grounds and at points 200 miles farther north. As yet we do not know the size, quality, or season of the crosses, but past experience in Europe and America favors the belief that out of the large number we will secure a few that will approach our ideal in size, quality and season.

The time of ripening is very important. It is now conceded that we have enough early varieties, and enough for fall and early winter home use, or for market. We need late keepers as hardy and fruitful as the Oldenburg. Hence all our efforts at improvement are in this direction. In other words we use the latest maturing varieties of the ironclads for mothers, and the pollen of the latest keepers of fair to very good quality. We have top-worked many of our most promising crosses and hybrids and will soon know something of their fruits.

With pears we have equal promise of combining hardiness of tree with quality of fruit. We have in bearing the wild pears of the upper Volga and cultivated varieties from Central Russia fully as hardy in wood as the Oldenburg apple. With the use of the pollen of the best West European and American sorts we have reason to hope for material gain in quality; as with the apple, we have demonstrated the hardiness of the resulting seedlings but as yet we have not tested their fruits. With plums we have used some of our best native sorts for mothers such as De Soto, Wyant, Hawkeye, Wolf and Cheney, and the hardiest and best of the Russian plums such as Early Red, Varonesli Yellow and Moldavka. We have used pollen of the Yellow Mirabelle, the Oregon Peach plum, and the best of the Japan plums, which have long been cultivated.

In hardiness of wood the plum seedlings, so far, have followed, with very few exceptions, the mother varieties. As an instance, the seedlings resulting from crossing the pollen of a very large and good Oregon variety on the De Soto seem fully as hardy as our native sorts, and the first fruits are of fine size, with blue bloom, and the deep suture of the foreign plums. As the tree attains age we hope for a very near approach to the Pacific variety in size and quality on a tree retaining the leaf and bud of our native species.

We are using the hardiest and best of the Eastern European varieties of cherries for mothers and the pollen of the best varieties of the continent. In the gathering of pollen from the Pacific coast, the South, and the East, we find the aid of our widely scattered students of the past twenty years very convenient and useful. In our work we have demonstrated the fact that dry pollen may be sent by mail across the continent, and germinated six weeks after its arrival. Indeed we have much the best success with pollen gathered farther south, or on the Pacific Coast, fully three or four weeks before our blossoms are ready to receive it.

In our varied lines of work we sometimes reach interesting results. As an instance, we had two seedlings six years old of a thornless species of Gooseberry from the Amur river in Asia. During the past three years they have blossomed profusely, but not a single berry was formed. When some of the blossoms were fertilized with pollen of the Triumph and Industry, fruits were formed in almost every instance. As the Amur bushes are models of health and vigor of growth, and perfectly smooth in branch and fruit, we have reason to hope for valuable results from the crossed seeds which appear to be perfect.

In crossing the primitive roses, growing in the open air, we have had the most perfect success in using the pollen of the best Tea and Hybrid Perpetuals. We have used as mother plants the white and pink varieties of *Rosa rugosa* from Japan, and four Rugosa varieties imported from Eastern Europe including the half double Rugosa from Poland. We have also used some of our native species, and several from East Europe and North Central Asia. We have had uniform and almost perfect success with all our rose crosses this season, which is peculiar considering the fact that Jackson Dawson says his fair success with rose crossing has been on indoor plants.

Another peculiar experience was our work in crossing the cherry and plum during the continued wet weather of the blooming period. We crossed many hundred blossoms and not a single specimen of fruit was formed under the sacks except on the varieties that bloomed very early or very late and which were favored with some fair weather and sunshine. In every case when the sacks were put on in cloudy weather, remaining continuously wet for five days, the fruit failed to develop in the moist atmosphere.

HARVESTING AND STORING POTATOES.

E. N. GEORGE, NEW YORK.

That potatoes require even more care than grain in harvesting, is verified by a long experience. Unless the soil is very heavy and wet, digging should never be done early in the fall. Potatoes should remain in the ground until the vines have become dead, and, if the weather is warm and dry, they should remain still longer. Of course there are exceptions as when blight withers the vines and extends down to rot the tubers. Then the crop should be harvested and stored in a dry, cool place as quickly as possible.

Provided normal conditions exist, and there is no disease in the crop, potatoes for winter storing should remain undug until late fall, even until the last of October. If possible, harvest when the ground is dry, and do not let the tubers be exposed to the wind and sun any longer than to evaporate the moisture clinging to them. Whether dug with a hoe, hook, or horse potato digger, avoid harshness in removing the potatoes from the ground. One reason why potatoes should be left in the ground until fully ripe is to toughen their tender skins to obviate easy abrasion, but, of course, the principle reason therefor is that the tubers may become thoroughly mature, so as to be a heathful, nutritious food.

The potato tubers should not be allowed to burn in the sun, or their fine flavor will be destroyed. The crop should be handled as little as possible to prevent abrasions that do irreparable injury. It is always the best plan to do the assorting in the field when the tubers are gathered. Place the merchantable potatoes carefully in crates, or baskets, never throw them roughly in, and do not take them from these receptacles until they are put in the bins in the

cellar. The mode, practiced by some farmers, of pouring them into a wagon box in the field, from which they are shoveled into a chute, whence they slide into the cellar, is ruinous to their keeping qualities, and should never be practiced.

The cellar, or store room, should be dry, well ventilated, and cool. Do not mass the potatoes together in big bins; they will "sweat" the same as hay or grain when in bulk, and will heat and rot if there is no ready escape for the moisture. To store potatoes in pits to remain until spring, select a dry elevated spot, and, whether buried below the surface, or covered above the ground, always leave a free space over the potatoes for the evaporation of moisture. Potatoes thus kept will not sprout during the winter.

THE GRAPE INDUSTRY IN CALIFORNIA.

GEORGE HUSMANN, CALIFORNIA.

From an experience of nearly eleven years in the Golden State, I still consider California as pre-eminently the Vineland of this great country, and I have an abiding faith in its ultimate success as such. But the prospect is gloomy now to the casual observer. Ruinously low prices for grape products, insects and diseases, frosts with their effects, and stagnation of business, have already bankrupted many who entered with high hopes upon this vocation, and more will follow before the industry can rise.

This is not the first crisis of the kind. In the Seventies there was a period when there was no sale for wine or grapes, and hogs were turned into the vineyard, because it would not pay their owners to gather the grapes. The Mission grape, which was about the only available one then, does not make a delicate white wine, and produces a very poor claret in most localities. Most of the vineyardists had very little experience in wine making, and when this crude product was brought upon the market it found but few buyers, and created a very unfavorable impression wherever introduced. But some fair wines had been made, were appreciated by some, and created a market for better goods. Prices rose and the dealers looked around for supplies to meet the demand. This led to the first and greatest mistake, which has been a stumbling block ever since. California wine producers and makers were, with few exceptions, men who had handled and made but little wine, and if any of them were conversant with the process it had been in an entirely different climate. They found a great deal of indifferent material and often handled it without the requisite knowledge and skill. Very many poor and milk-sour wines were made, which had to be doctored up by the dealers to be made salable at all, especially as very few of the producers had the facilities for ageing. Thus it became the custom for the dealer to make his round among the wine cellars within six months from the time the wine was made, sample all the wines in each cellar, good, bad or indifferent, and offer a uniform price for it. The purchaser was not allowed a choice, he had to take them all if he wanted any. Wines were scarce then and prices good. It was at that time a great convenience to the producer, but it was also the means of putting a great deal of poor wine on the market. The dealer had invested his money and naturally tried to get it out again, the poor stuff was blended with the good to make it salable at all, doctored with "prune juice" and other stuff, and then sold as California wine; while the fine flavored wines were to a large extent, and are to-day, sold under French and German labels as fine Hocks, Sauternes, or choice French Clarets, and in that guise bring treble the price of the honestly branded California product. This State got all the blame for the poor stuff, which ought not to be marketed at all, and no credit for the really choice wines already produced in the fine climate.

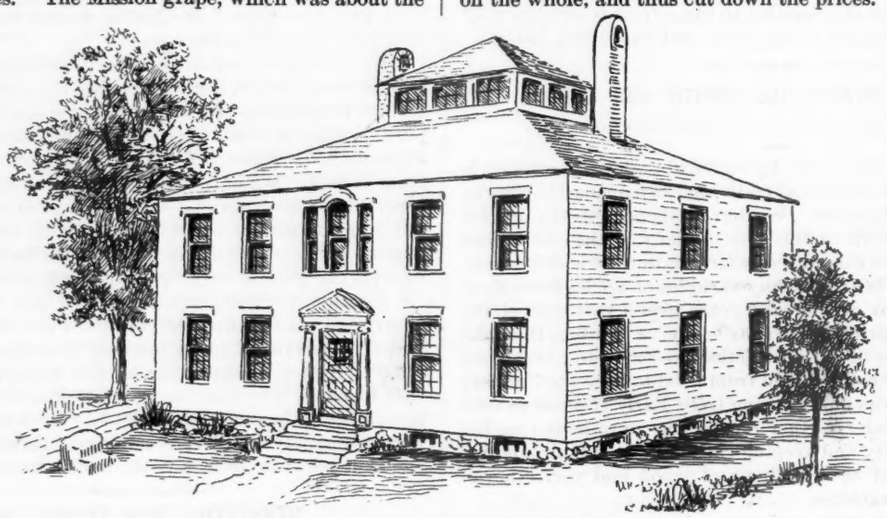


FIG. 1. OLD STYLE SQUARE FARM HOUSE.

Californians are ever enthusiasts and, generally, specialists. If they think they see money in a business they rush into it. Thus when it became known that from $2.50 to $3.50 were paid per ton for grapes by the winemakers, while five tons per acre was considered a fair average crop, while the cost of production was only about $2.50 per acre annually, they saw speedy fortunes in the grape, and everybody and his neighbor commenced planting by hundreds of acres. Grapes were planted in all locations, in all soils, but mostly on our rich, level bottom lands, where they produced quantity indeed, but lacked in color and quality. Thus, while under the system of selling the whole stock in a cellar, little could be done to make a reputation and enhance consumption, production increased in a few years from 8,000,000 to 25,000,000 gallons of wine, more than could be sold by the few wholesale firms there engaged, and prices of wine and grapes fell to an unprofitable figure.

The low prices induced many of the producers to ship their wines east on their own account in large quantities, hoping to find purchasers there who would mature it. This they failed to do, and the wine, being immature, had to be sold for a song, and injured the reputation of California wines still more. A few home dealers were unscrupulous and short-sighted enough to take advantage of the difficulties in which the producers were involved to purchase from them at figures which they could easily see would not half pay them for their labor, but ruin the industry, and sold the inferior wines thus purchased at a figure which still would give them a profit of one or two cents per gallon, while they could sell the good wines purchased with the bad at high figures, make a good profit on the whole, and thus cut down the prices. This policy has bankrupted most of the vineyardists; they have become discouraged and have abandoned their once flourishing and well cultivated vineyards to neglect and the phylloxera. But the turning point has been reached, and the near future will bring relief to the remaining producers who have been able to weather the storm. It will be a clear case of the survival of the fittest, and those of the dealers who were unscrupulous and shortsighted enough to build their immense cellars and storehouses on the ruin of the producer may find themselves caught in their own snare. The crop of this year will be a very short one. Repeated spring frosts, phylloxera and neglect, as well as the so called Anaheim disease at the South, will bring the crop down very low; and while they, even in the face of all this and an increased consumption abroad, hold off from buying, expecting, no doubt, that just before the vintage the producers will be compelled to sell to them at their own figures, to make room for the next crop and obtain some means to harvest it with; their own cellars and cooperage are emptying fast, while the demand for good California wines is constantly increasing, and they will be compelled to replenish when it may be too late to do so.

The grape growers of California have combined and resolved not to sell their wines below a price which will barely pay them for their labor. The banks have declared their willingness to wait on them, and if the majority can hold out for six months longer, or after the crop has been harvested, prices must rise. There is empty cooperage and cellar room enough to house this season's crop, while the casks and cellars of the dealers are emptying more and more every day. Had they combined among themselves to keep up to paying prices instead of cutting each others' throats by underselling, all this could have been avoided and the industry established on a firm and paying basis. As it is now, thousands of acres of once promising and well cultivated vineyards have been pulled up to make room for grain, or orchards. The phylloxera is making terrible havoc in some of our best districts, while the Anaheim disease, as yet unexplained, is making inroads from the South.

IMPROVED FARM HOUSES.

D. COMINGS.

The buildings of the Colonial times which survive in the early settled towns, are evidences of the durability and strength which were embodied in their solid walls and heavy framework by the squire or landlord of olden days. The plainness which characterized the exterior was equally marked within by the immense rectangular rooms, although the chimney-pieces and moldings are marvels, considering the amount of hand work displayed in their mechanical designs. The dreariness of these great rooms has sometimes condemned the old mansion, the owner choosing a smaller, more modern cottage raised from its ruins, rather than live longer subject to its airy hospitality. Often its silent protest brings regret after the deed is done; for with the destruction of the old house go all the associations attached to it and all the charm which is found in the ancient European homesteads. The faults and inconveniences of these old houses may be corrected. The illustration Fig. 1 represents a house forty by fifty-four feet with an ell fourteen by fifteen feet. Before remodeling, a few steps led to the front door opening into a long hall; on the left was a very large parlor (Fig. 3) with two bedrooms in the rear; on the right the front room was of the same size, and held the dignified position of sitting-room and dining-room combined; it also boasted of two small closets, one on either side of the fireplace, and the only ones in the house. The fragrant and appetizing kitchen oders found ready entrance at two side doors. These doors were an evidence of the stable equilibrium and well balanced symmetry necessary, according to the architect's mind, in designing the house, and no doubt prevented many a collision between the cook and the children. When the cook with the roast entered the dining-room door she could send the frolickers into the sitting-room through the other entrance. The kitchen had been despoiled of its capacious brick oven by an earlier reformer, leaving four straight walls, exempt from conveniences, except a stairway to the cellar under the stairs midway of the hall, and, instead of kitchen accommodations, a large storage and washroom was appended in the rear, being furnished with milk and cheese cupboards and other furniture. A stoop made a way of exit at the rear, where a semblance of a driveway led to the barns.

FIG. 2. OLD FARM HOUSE MODERNIZED.

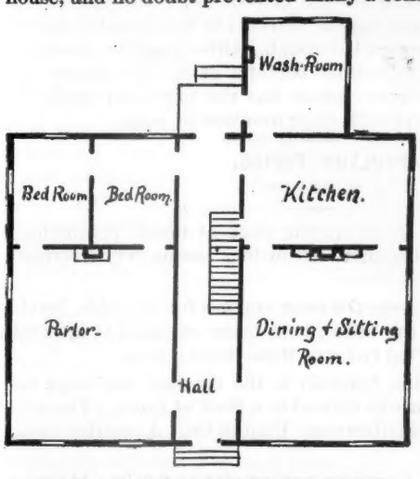


FIG. 3. GROUND PLAN OF OLD HOUSE.

How to repair such an old house with the least inconvenience while living within, is sometimes a puzzle. In this case the best way is to put on the rear porch first (Fig. 4) as it will be convenient to work under and roomy for the temporary storage of furniture. The washroom is next partitioned off, making a good-sized pantry with plenty of shelving, putting in a window at the end. A closet and cupboard are made in the corners near the chimney, and running water, sink and row of tubs, equip the other end of the small but convenient kitchen. When this is done the door, with its framework, leading into the old kitchen may be removed and the little corner space thrown into that room. Glass panels are put into the outside door to light this passage.

The new kitchen being remodeled, the old one may have a partition run through it, making a good-sized bedroom, library or breakfast-room, with a passage leading into the back hall, thus formed, where back stairs are now built, having closets underneath. This room is used for a temporary dining-room, while the old dining-room is remodeled. A middle partition is put in with sliding doors, and a door put through into the hall at the foot of the stairs. The old cupboards are removed from the chimney corners, the mantel renovated and a bay window built on at the end. A neat dining-room is thus made, leaving a comfortable sitting-room in front. The only carpentry to be done in this, is the making of folding-doors into the hall. Having this entire half of the house in order, the rear is again attacked. Building a wall in the middle line of the small bedroom opening into the hall, the end of this space is fitted into three closets as shown in the plan and the remaining space thrown into the hall. The old partition between the two bedrooms back of the parlor, is then removed. A more convenient bedroom is thus made. An alcove is made back of the stairs, and a double window in this part of the hall forming a cozy little reception-room, or sewing-room. The parlor is changed very slightly, folding-doors being placed opposite those in the sitting-room. If these door frames are made so as to carry the woodwork up to the ceiling and false beams are put across overhead, it will panel off this hall to advantage, which effect will be heightened by draperies and a fine balustrade. With suitable decorations the interior should suit even fastidious tastes. The outside of the building can be greatly improved by building a veranda across the hall and parlor with a carriage entrance (Fig. 2) at the end, through which the drive is carefully laid out and graveled. The roof is extended, forming a jet eighteen inches wide all around, putting brackets below, an effect like a cornice being carried down to the level of the second story window caps. A gable is added to the main roof over the front door. Lay walks to the porches, make a few additions of shrubbery to the grounds, and a home is now furnished at a little cost that is far more desirable than a new cottage, whose main characteristic might be an effort to appear quaint with no justifying semblance of age.

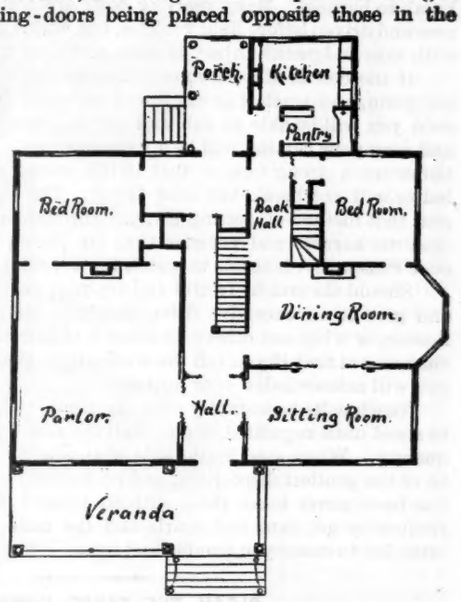


FIG. 4. GROUND PLAN OF IMPROVED HOUSE.

WORK FOR RAINY DAYS.

L. D. SNOOK.

Farmers should so arrange their business that during showers or rainy days there will be work indoors for themselves and men. There are always plenty of odd jobs that should receive attention, such as putting in new floors in place of those badly worn in the stables, or perhaps the mangers and feed boxes need to be repaired, enlarged or changed. The hay rack may need some new pieces, or the wagons may need a coat of paint. Some of the farm implements may require repairing or overhauling, or new bolts in certain places. New castings may be added where needed.

On reapers and mowers, the sections and guards should be alway kept in good order. The oiling places should be well and thoroughly cleaned from gum and dirt, and if they are not provided with a cap a wooden plug can easily be fitted in, and we will then be quite certain that in applying oil it will lubricate the part intended. To do all this, a few common tools will be needed, and a work bench on which to do a great deal of the work. A large window should be located near the bench, preferably, directly in front of where the vise is placed, as a vast amount of the most difficult work is held by that tool.

Every farmer should have laid away under shelter a supply of well seasoned timber suitable for whiffletrees, and other parts of implements liable to break or wear out, for it does not pay to run to the shop to get a new whiffletree made every time one is broken. The bill at the shop, in one year would enable one to purchase all the tools necessary to do the work at home besides it will save many hours and perhaps days of valuable time. The feeling of independence and the discipline the working with tools will give you is a very important consideration. If you have sons let them work with the tools, show them how to use and properly care for them, thus making farm life pleasant and useful.

TRAINING COLTS.

S. YATES.

The practice of letting colts run wild until they are two or three years old has been changed to the habit of breaking to halter while young. Often they are broken to lead before they are weaned, and are handled and petted more or less until considered old enough to break to harness. Many yearling colts are actually broken to harness and driven before light vehicles, but, at this age, unless managed with rare judgment, injury is liable to follow from overexertion.

If the colt is of a nervous temperament, treat kindly by feeding grain, and teach it to eat lumps of sugar from your hand and soon you will be able to rub and pet it. Speak gently to the colt and soon your coming will be a welcome visit. When tying with a halter use a strong one, so that if it is scared and pulls back, the halter will not break but hold firmly. The colt will not soon repeat that method of getting away. Throughout the breaking process, use harness and vehicles that are strong and safe. If a colt once runs away, it seems to watch for a similar opportunity.

Should the colt be fretful and try your patience, do not get mad and give it an excessive drive simply to let it know you are the master, or whip and otherwise abuse it to gain the same point. The chances are that if you tell the truth about the matter afterwards, you will acknowledge your mistake.

Teach colts to instantly obey the word "whoa," and train them to stand until requested to go. Call the colt by its name very frequently. When used by the side of another horse the latter should be of the gentlest disposition, and no matter how kind and trusty it has been, never leave them without tying both of them, as colts frequently get into bad snarls and the mate, however gentle, is often led to cause you trouble and loss.

CLEAN THE FENCE ROWS.

The strip of land along fences and hedges is usually a propagating place for foul weeds. The strip should be thoroughly cleaned at least once each year. In tilling the land it is best to plow as close to the fence as possible, as with land under cultivation, undesirable growths of plants are easily subdued. The strips along the fences are almost a loss as far as the production of any crop is concerned, and the amount of this character of land should be reduced year by year by the removal of division fences. The greatest economy is practiced in working large fields without troublesome fences. If you have a division fence of rails overgrown with weeds bushes and vines, the best plan is to set the fence over on the adjoining strip for one year; in the meantime thoroughly plow and cultivate the infected strip, sowing to grain and seeding down with grass. If the fence has been long located, the land will be found to be very fertile, in which case it will pay to cultivate for a term of years. Hoed crops, such as potatoes, will thrive for two years in succession without the aid of any fertilizer.

As fast as possible, dispense with rail and stump fences using those of wire instead. Never allow a weed to go to seed especially along the fences, and when bushes and vines appear, eradicate them the first season when they can be pulled up by the roots. If left two or three years they must be dug and the brush burned.

TRADE METHOD OF PRESERVING EGGS.

E. C. CORBETT, ILLINOIS.

Eggs will not hatch unless kept warm and air is admitted through the pores of the shell, but they will decay if any germs of bacteria enter through these pores. Eggs may be preserved through many years by the following process: Place the eggs in a barrel, or keg, or other air-tight vessel, and exhaust the air from the barrel by means of a plumber's air pump. Then fill the vessel with carbonic acid gas, which is allowed to surround the eggs for twenty-four hours. This removes all the germ-laden air. The charged reservoirs used for soda-water fountains work best, but carbonic acid gas may be made by pouring muriatic acid on pieces of marble or pure limestone in a large flask and conveying the gas to the eggs by a rubber or long glass tube.

The air-tight vessel containing the eggs is next filled with gasoline, or paraffine oil which is drawn off after twenty-four hours. This prepares the eggs for the permanent solution of silicate of soda or soluble glass, in which they will keep for years. In large quantities the silicate of soda can be cheaply procured through reliable druggists. One part of silicate of soda is dissolved in twenty parts of boiling water, which is then cooled, and it is best to make it very cold with ice. The air-tight vessel of eggs is filled with the cold solution of silicate of soda, sealed closely, and placed in a cool cellar. The solution will thus retain its low temperature, and the silicate will not separate from the water unless evaporation is allowed.

A forty-two gallon barrel will hold about one hundred and fifty dozen eggs. The barrel or keg need not be full of eggs, but when all the eggs are in, it should be reheaded, and the holes tightly plugged. No air should be allowed to enter after the air pump is used. The extraction of air and the filling with carbonic acid gas may be omitted with very fresh eggs. The oil may be used for many different vessels of eggs, and the silicate solution may be employed several times. The silicate of soda coats the egg with a transparent varnish, which may be detected by touching the smooth shell. Fresh eggs are somewhat rough. Otherwise the preserved egg is kept unchanged as neither bacteria germ, nor oxygen, nor heat can reach its substance, which has the taste and smell of a fresh egg. This plan pays with large numbers of eggs.

POULTRY TOPICS.

J. W. CAUGHEY.

It is much better to divide the flock at night, permitting a small number to roost together. Crowding results very frequently in diseases.

Grind up the bones from the meat you use for the table, leaving some of the meat on the bones, both being essential at intervals. Hens lay better if thus fed twice or three times a week.

The earthen drinking fountain is the cleanest and most convenient when water must be carried to a flock of fowls. The water remains cool longer in earthenware than in tin. A running stream is best of all.

The Silky fowl is a toy, yet many admire it for its odd appearance. The hens lay well, but their eggs are not large. Their feathers are like hair, standing up straight. Their wattles and combs are a bluish red color.

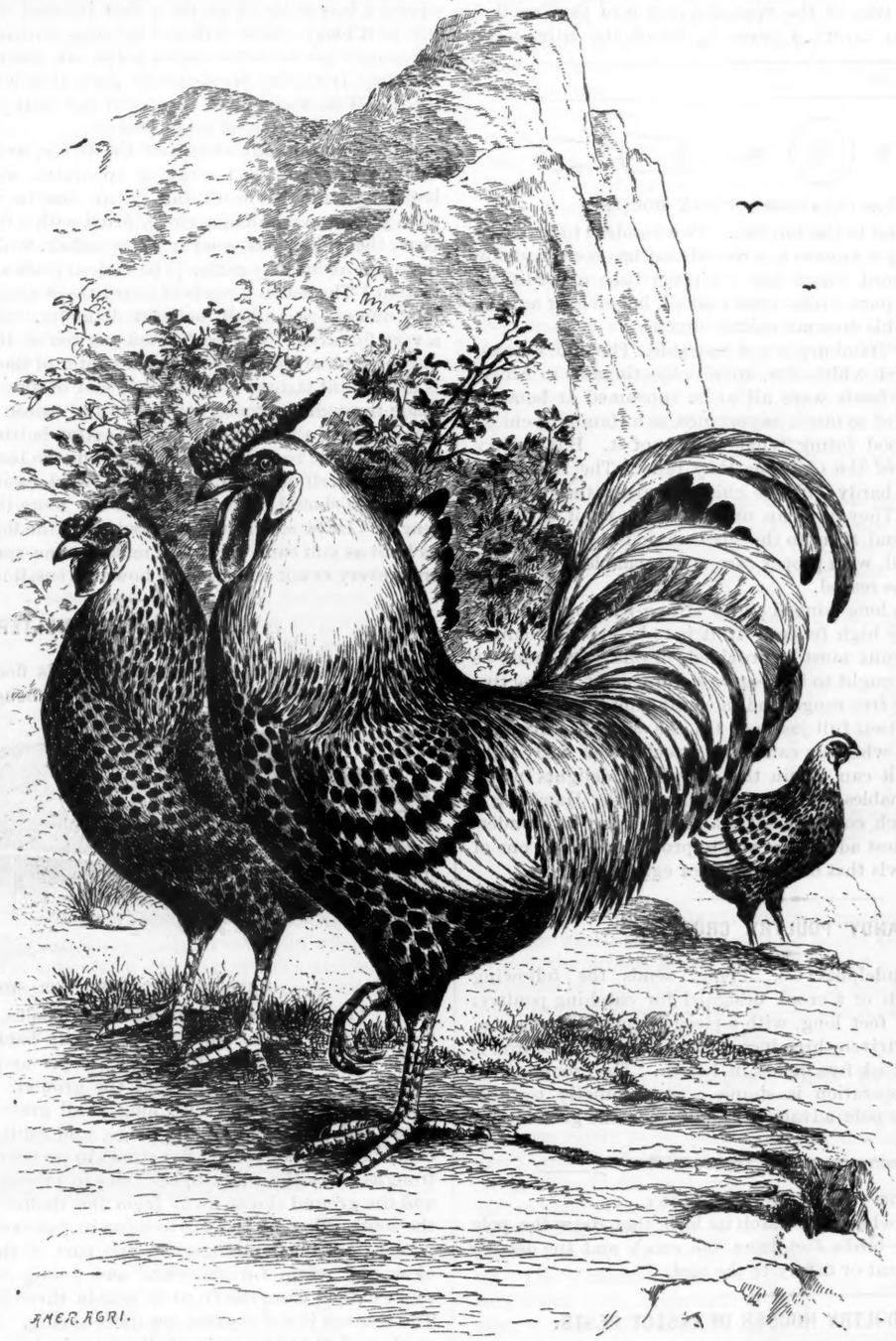
Keep the poultry in a house especially provided for them. Do not permit the manger in the horse or cow stable to be contaminated with the droppings making the food distasteful to the horse, or cow, that occupies the stall.

White Rose Comb Leghorns are preferable to the Single Comb in Northern climates where the winters are long and severe. A Rose Comb does not freeze and blacken as quickly as the Single Comb variety. They are as good layers and as pretty fowls.

THE SILVER SPANGLED HAMBURG.

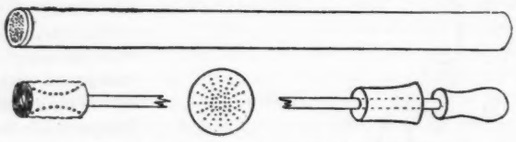
H. S. BABCOCK.

In these days of the rapid multiplication of new breeds and varieties, with their necessary uncertainty in breeding, it is something of a relief to be able to turn to a breed with a history, whose characteristics are certain and fixed enough to be depended upon. I would not be misunderstood. I believe that the multiplication of new breeds and varieties is of advantage to the poultry industry, that it awakens a more general interest in poultry, and leads to the keeping of many more fowls. It is an important element in the welfare of the country, increasing the food supply and reducing the cost of living. It is also the means by which more profitable fowls are to be produced, if it be possible to produce such. Nevertheless, new breeds often awaken hopes that are not realized and expectations that end in disappointment. But if a breed have age, its characteristics are known, its certainty of breeding with fidelity is assured. And such a breed, or, more accurately, such a variety of a breed, is the Silver Spangled Hamburg. Just how old the Hamburg fowl is cannot be accurately stated, but there is not a shadow of doubt that it is one of the oldest fowls known. Says Mr. Lewis Wright in his work upon poultry, "The spangled and black varieties * * * are evidently a native English breed of considerable antiquity, having been kept and shown at village exhibitions beyond the memory of man." And Mr. Teebay, writing more than a quarter of a century ago, said "I have known the Black Hamburgs ever since I was a boy. I do not exactly recollect whether the Silver Mooneys or the Blacks were the first fowls I possessed, but I believe the Black Pheasants, as they are called here. Both kinds, and also the Golden Mooneys, I have been told by reliable persons were exhibited for prizes, such as copper kettles, etc., more than a hundred years before my time. I have yet somewhere in the attics of my house about a dozen prize copper kettles, and many others have been given away to friends." From the above quotations it is easy to figure out quite a satisfactory antiquity for the Silver Spangled Hamburg, after it had reached a stage of breeding that fitted it for prize competition. But we can go still farther back, to the naturalist Aldrovandus, who wrote in Latin fully three centuries ago. He describes as a Turkish fowl, one that possesses many Hamburg characteristics. He says, "The cock is called the Turkish cock. His whole body is in a manner inclined to white. Still, the wing feathers are partly black. The tail consists of feathers that are partly green, partly black; some, also, are half green, some half black. His whole body is exquisitely adorned with lines that are sometimes golden, sometimes silver, and it is wonderful how beautiful an effect this produces. His legs and feet are tinged with blue. *The hen, which also is called Turkish, is all white, sprinkled over with black spots;* she has the feet tinged with blue, and the wattles short when compared with those of the male. *Another hen presents the same appearance,* except that her neck is yellowish; she carries a sharp point on the top of her head, her feet are altogether blue, and her tail is immaculate." The italics are mine. Here, at least in the hens, are the white ground color, the black spots, the blue legs, and, if the "sharp point on the top of her head" means the spike of a rose comb, the distinctive comb of the Hamburg. But even if we reject this description as applying to the Hamburg at all, we still can claim a respectable antiquity for the fowl, sufficient for all practical considerations. In the early days of the Silver Spangled Hamburg it was separated into two varieties, known as Silver Pheasants and Silver Mooneys. The ancient habitat of the Silver Pheasant in England was Yorkshire; of the Mooney, Lancashire. The Mooneys were celebrated for the perfection to which the spangling had been brought, but the males were hen-feathered. The Pheasants were less perfect in marking but the males were fully feathered. At first these varieties were shown side by side, but after a time they were amalgamated, the result being the production of the fowl we know in our day as the Silver Spangled Hamburg, which combines in a remarkable degree the excellencies of its two parents. It is a small fowl, but has an exceedingly graceful shape, every line being an easy and flowing one. It is sprightly, active, vivacious. The males have full tails well-furnished with sickles and coverts and carried at a moderate elevation, more upright than the Game but less than the Leghorn. The combs are rose, with a well-developed spike; the legs



TRIO OF HIGH-BRED SILVER-SPANGLED HAMBURGS.

and feet blue; the ear lobes white. The ground color of the plumage is a green silvery white, the feathers ending in a large round spangle, or moon, of rich black. These spangles form a double bar across each wing and, ending, as they do, the feathers, they make for the fowl a white tail with a row of round black spots at the tip. The sickle feathers of the male are particularly handsome with their long sweep of white terminating in a round rich-black spangle. In figure and in color the Silver Spangled Hamburg is a very beautiful fowl. And it is not only beautiful but useful. Among layers it has few, if any, superiors. This characteristic belongs to all varieties of the breed; and it is as true of the Spangled as it is of the Penciled that they are everyday layers, a name by which the latter were



SYRINGE FOR CLEANING POULTRY HOUSES.

introduced from Holland to the English. Two hundred to two hundred and twenty eggs per annum is a record that has been made by this variety and a record which has not often been exceeded by others. The eggs are pure white, rather small, but so long as eggs are sold by the dozen this does not matter much.

As a table fowl the Hamburg is not desirable. The blue shanks, the small size, the bluish white skin, are all objectionable in American markets. If the fowls were all to be consumed at home it would not be a matter of so much importance, as a Hamburg chicken is after all very good eating, what there is of it. But poultry keepers do not eat all of the chickens they raise. The Hamburg, when mature, is quite hardy, but the chickens are rather delicate and difficult to rear. They have an unsatisfactory habit of dying that does not recommend them to the man anxious to raise every chick he hatches. Still, with proper care, a reasonable percentage of those hatched can be reared.

The Hamburg is a long-winged and a strong-winged fowl, and can easily fly over very high fences. If it is to be kept in confinement either covered runs must be provided, or one wing must be clipped. But it never ought to be kept in confinement. Its active habit was intended for free range, and in confinement it chafes and frets and does not do itself full justice. On the wide pastures and meadows of the farm, where it can hunt insects from early light until eventide, where it can obtain the exercise it delights in and the varied food that enables it to fulfill its mission, the Hamburg is at its best. Under such conditions it is able to display its wonderful beauty to the greatest advantage and to prove its title as one of the most profitable fowls that can be kept for eggs alone.

HANDY POULTRY CROOK.

C. Jarscen, Philadelphia Co., Penn,. sends the following description and sketch of a crook designed for catching poultry: The pole is round, ten feet long, with a piece of quarter-inch iron, nineteen inches long, driven three inches into the end. This iron is so bent as to form a hook five inches in length. The crook is then ready for use. Its operation is simple. Steps quietly towards the fowl, and with the pole advanced and close to the ground, put

CROOK FOR CATCHING POULTRY.

the hook under the fowl so as to catch its legs, then draw the pole gently, disengage the bird's feet from the crook and the deed is done without excitement or injury to the bird.

CLEARING POULTRY HOUSES OF INSECT PESTS.

FRED GRUNDY, ILLINOIS.

The poultry house should be thoroughly cleaned out before extreme cold weather, and every louse and mite in the walls, nest-boxes, and perches, destroyed with kerosene. Straw that has been used for bedding horses is best for lining nests. It is beaten flat and soft, and the hens can quickly adjust it to suit themselves, and they invariably construct nicely-rounded and attractive nests of it, in which even the thinnest-shelled eggs are rarely broken. Great care should be taken to see that there is no grain in the straw, for if a hen finds a single one she is almost certain to tear the nest to pieces seeking for more. When the nests in the poultry house are clean, free from vermin, and nicely lined with soft material, the pullets will naturally go to them when they begin laying. When they are foul, or hard, or infested with vermin, the pullets drop their eggs in the corners of the yard, off the perches, and almost anywhere. Some of them are broken, the hens get a taste of egg, and the trials of the poultry keeper have just begun.

For destroying lice, mites, and all other insect pests that infest poultry houses, long experience has shown that kerosene is the best article that can be used. It is abundant, cheap, and sure death to every insect it touches. The poultry keeper cannot reasonably expect a hen to lay or sit on a nest infested with lice, and she will not do it long. Hens will not lay eggs during the fall and winter, when eggs are valuable, unless pains are taken to keep their quarters free from the blood-thirsty pests that make life a burden to them. With decent care they will not only pay the cost of their keep, but return a good profit besides.

First, thoroughly clean out the house, and then spray it with the kerosene. A good spraying apparatus, with cyclone nozzle, is best for doing this work, but it can also be very effectively done with a common garden syringe, fitted with a fine rose. For several years the writer has used a cheap affair, which any tinsmith can make for about fifty cents. [The various parts are shown in the illustration.] The barrel is made of heavy tin or zinc, and is twenty inches long and one and a half inches in diameter. On one end is soldered a very fine rose. The perforated portion of this rose should cover only about one inch of space in the center of the end. A plug of wood is made to fit tightly into the open end of the barrel, and a hole is made through the center of it for the piston rod to pass through. The piston is a wad of soft rags or cotton batting, securely bound to the end of the rod. This wad should fit the barrel very tightly, and should be well oiled, so that it will work easily. When in use the piston rod should never be drawn out more than one-fourth of its length. Draw slowly when drawing in the liquid, but force it out as hard as you can. This will make a fine spray, which will penetrate every crack and crevice, however small it may be.

A GOOD SHEEP SHELTER.

A successful sheep raiser shelters his flock in the convenient shed shown in our illustration. The only bought lumber is for the

A CONVENIENT SHED FOR SHEEP.

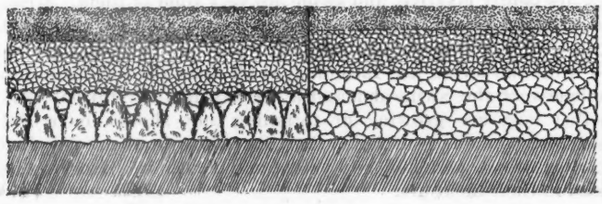
ends. The frame is made of posts and poles, hewed only near the mortises and tenons, and sloping gently back to a low and tight stone wall. The forward pitch is steeper and shorter, reaching to within four and a half feet of the ground. The roof is made of slabs and poles covered with long swail grass, two feet deep at the eaves and eight feet at the ridge, and built like a stack to shed rain. The posts stand on flat stones to prevent decay. Board eaves troughs carry the water to the sides to prevent a mudhole in front, and the ground slopes away from the shelter. The shed opens to the south, allowing the sun to shine in, but excluding the prevailing winds. During lambing time, one part of the shed is boarded up close and warm for the ewes and young lambs. Movable feed racks extend from the front to within three feet of the back wall. The manure is not cleaned out until spring. Abundant bedding is used, and the dry compost thus made is a rich fertilizer. This shed is twenty-five by sixty feet, and will easily hold 100 sheep.

Small Butter-Making Machines. — While the hand separators admit of better work in butter making on the farm there is still considerable skill required in manipulating the cream and working the churn. These troubles are almost entirely eliminated by the butter-making machines because they produce the finished article ready for marketing, and in the best possible condition. The farmer should have all the profits of his product and a uniform machine-made butter will obtain creamery prices and save costs and commissions of the factory.

ESSENTIALS OF TELFORD AND MACADAM ROADS.

LOUIS H. GIBSON, INDIANA.

The essential difference between a Telford and Macadam road is in the foundation. The Telford base is made of six or eight inch rocks or bowlders, or large pieces of irregular-shaped stone, on which is placed a layer of coarsely-broken stone, and this is surfaced with pieces which do not average more than three-quarters of



TELFORD ROAD. MACADAM ROAD.

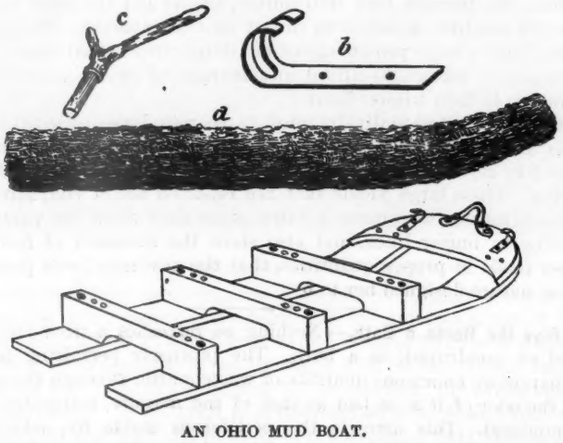
an inch in diameter. The Macadam road has the foundation of broken stone an inch and a half to two inches in diameter, a second covering somewhat smaller, and the top finer yet. These differences are shown in the illustration.

During nearly a century these roads have been in use, and there have been some changes, more in detail than in principle. The Macadam roadway is frequently made in two layers. Sometimes the first covering is only four or five inches, followed by a second of about the same thickness. At other times the covering aggregates thirteen or fourteen inches, divided into three layers. In the original Telford road the inventor insisted that the broken stone be such as would pass through a two-and-a-half-inch ring, and that the surface be made of broken stone, which would average three-quarters of an inch in diameter. Macadam was more particular about weight than about size. His idea was that each stone should be six ounces in weight, and, with that end in view, his help carried balances with which to test the weight of the stone.

In the Telford road it was evidently the idea to put the large stones at the bottom, in order to prevent the soft ground from working through. By not breaking this stone, labor is saved, but worn places may reach the rough rocks. It is fair to say that both are good roads, as any one who has traveled over the two kinds will testify. Both have had severe tests, and each has its friends.

A SLED FOR MUDDY GROUND.

A mud boat is a sled with broad runners. It has many advantages over the narrow runner sled, when there is but a small amount of snow, or after a thaw. The broad runners pass over mudholes, and slushy places without cutting down. The accompanying illustrations are from sketches sent us by Richard Jones, of Franklin Co., Ohio. The runners are sawed from a log, *a*, bent at one end. Saw to the angle from one end, reverse, and saw from the other end. The part of the runner which rests on the ground

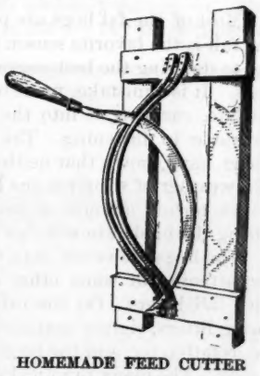


AN OHIO MUD BOAT.

should be ten feet long, the other part, about two feet long with a rise of eight inches. The bunks are pinned or bolted. The nose piece is about eight inches wide and securely bolted. At each end fasten the grabs, *b*, for holding the brace chains, by which the tongue can be made rigid, or flexible at will. Each chain should be fastened well forward on the tongue, and be about five links longer than is needed for rigid bracing. With unhooked chains, the hinged tongue allows the sled to be placed parallel with the log while the team is nearly at right angles. Slack chains permit the sled to wind between stumps and through very crooked roads. With this sled two horses can haul enough logs to make 1,000 feet of square timber. Straw or hay can be hauled by inserting at the end of the bunks standard, *c*, on which side boards are placed.

CHEAP FEED CUTTER.

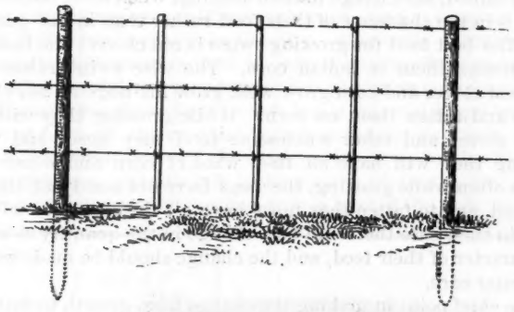
The handy feed cutter shown in the engraving, has a steel knife made the shape of the old-fashioned grain sickle but with wider blade. Two pieces of one-fourth by one inch iron are bent in the same shape, and bolted to pieces fastened to feed room wall. The irons should be just far enough apart, to allow the knife to pass down between them. The knife is raised, the sheaf placed under, and the cut made. The sickle must be kept very sharp to do good work. Care must be taken that the fingers are not caught and wounded while slicing the feed. Turnips and sugar beets may be sliced with this contrivance. The chief advantage in cutting hay is that grain may be mixed with the food. Sliced roots are much easier eaten by cows and sheep than the compact large roots. It is well to moisten chopped hay before feeding.



HOMEMADE FEED CUTTER

WIRE FENCE STAYS.

Where fence posts are expensive it is an object to use as few as possible. On a Kansas farm, the posts are placed four rods apart. For stays, laths are wired to the barbed wire at every rod as shown in the illustration, a sketch of which has been sent by J. Mecir.

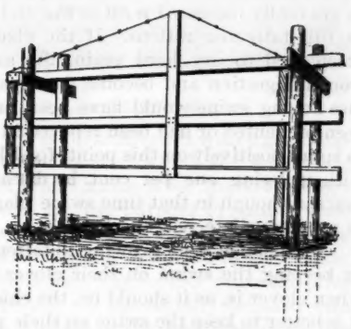


AN INEXPENSIVE FARM FENCE.

Number nine plain annealed wire is cut in six inch lengths and bent to the proper shape, over one side of a lath by hand. A boy holds the lath in place, the bent wire is quickly slipped around lath and wire, and grasped with a pair of pinchers, and with two or three turns they were solidly secured.

A SLIDING FARM GATE.

There are still large sections of country, in which even cheap gates are rarely to be seen. The rail fences have to be laid down every time a field is entered. The hinge gate requires some skill to make, and the posts used must be heavy, and well and firmly set. The illustration of a very cheap gate, engraved after a sketch from J. M. Rice, Mo., shows a gate that any farmer, who can use a coarse saw and drive a nail, can readily make. It is designed for a place where small stock are restrained. For a full gate cut the cross pieces of the same length as the front, and add two more boards. There are two posts for each end of the gate, and they may be just the ordinary post, with no extra bracing, as the gate slides on the cleat nailed to the back posts. It will be observed that the back posts stand so that the



A SIMPLE GATE.

cleat can be nailed to the front edge of one, and the back edge of the other, giving room for the gate to be swung around toward the side of the post standing furthest back. When the gate is closed, the front end rests on the cleat nailed to the front posts. A barbed wire may be stretched across the top.

FATTENING HOGS.

JOHN M. STAHL, ILLINOIS.

Most of the fat hogs are put on the market during the winter. The fall is the favorite season for fattening them. This is doubtless due to its being the best season; but to this there are many exceptions. It is a mistake, made by many, to begin the fattening process too late, carrying it into the severe winter weather which is not favorable to fattening. The experiments of Prof. Sanborn, and others, have shown that neither the hot weather of summer nor the cold weather of winter is the best for fattening. The greatest gain from a certain amount of food is made, other things being equal, during the moderate weather of autumn.

The hogs, however, may reach the most profitable age and size for fattening at some other season. This will likely be the case with fall litters. On the other hand, fall is the season at which spring litters, rightly managed, reach the age and size most favorable to fattening, and the large majority of pigs are littered in the spring. The many practical experiments in pig feeding prove that the most profitable age at which to market a hog is nine or ten months, at which age it can be made to weigh 250 to 300 pounds; and feeding to make this weight at this age is the most profitable. This feeding makes a steady, regular gain, moderately accelerated during six to eight weeks at the close. A common mistake is to make too abrupt a change in food that inaugurates the fattening process. This is in large part due to the previous feeding being too scant; the pigs being on a slow growth when they should grow fast.

When the animals are heavily fed, when a fast growth is steadily maintained, the change in their feeding, when their fattening is begun, is in the character of their food rather than in the quantity of it. The best food for growing swine is red clover; the best feed for fattening them is Indian corn. The wise swine raiser will, where red clover and corn grow well, grow his hogs on red clover, pasture and fatten them on corn. While growing they will have all the clover and other wholesome food they need; and while fattening they will have all they want of corn and other food. But too often while growing, the hogs have not nearly all the feed they need, and to fatten they must have all the corn they will eat; hence, in their case there will be a change in the quantity as well as the character of their feed, and the change should be made with all the greater care.

The chief point in making the change from growth to fattening is to make it gradually. As little violence as possible should be done to existing conditions surrounding, and within, the animal. If the quantity of food is to be increased, the increase should be made by a small addition about every ten days. If the total increase is made at once, or in two or three days, the digestive and assimilative organs of the swine will be overtaxed, there will be indigestion, constipation and loss of appetite, and, if there is not positive disease, at the least there will not be a satisfactory gain. Though the change is only in the character of the feed, it should be made gradually. If corn is to be substituted for clover as the principal feed, it should not be done in a day. The quantity of corn should be gradually increased until at the end of two weeks the swine are on full fattening rations. If the change is suddenly made from green feed to dry, hard grain, the animals will certainly suffer from indigestion and become constipated. Four-fifths of the disease among swine would have been prevented if constipation had been prevented or had been relieved in good time. I feel at liberty to speak positively on this point, for I have raised hogs extensively without losing one per cent. by disease during the past twenty years, although in that time swine plague has several times raged in my immediate neighborhood.

The change from growing to fattening ration can best be made by keeping the swine on their clover pasture during the change, when clover is, as it should be, the chief growing feed. I find that it is better to keep the swine on their pasture while they are being fattened, unless the pasture is too large. Not more than forty to fifty hogs should be fattened in one herd, and a herd of this size, or less will do better in a ten to fifteen acre pasture field than in a feed lot. It took me some years to learn this. I thought that if given the range of a field, swine would take too much exercise, and walk off too much fat. But full fed swine, especially when fed fattening foods, will not take too much exercise. Digestion and assimilation and the general health of the animals are better because of the exercise the pasture field permits and induces; and the bites of pasture obtained are beneficial.

Swine fed all they will eat of fattening feeds, especially of corn, will surely become constipated, unless attention is given to keeping their bowels open. For this purpose I esteem pumpkins very highly. They are gently laxative, and swine are very fond of them. Green feed, steamed clover, bran slop and boiled apples, are also good. It can hardly be necessary to say that while corn may be the chief feed while the swine are fattening, at all times the thrift and profitableness of the swine demand a variety in their ration. And whether hogs are growing or fattening they should have salt, wood ashes and charcoal regularly. Fattening hogs are also fond of rotten wood, and find enjoyment and benefit in a decaying log placed in their inclosure.

The full rations and rich, heating, fattening foods cause great thirst, and fattening swine should be supplied liberally with pure water of an agreeable temperature. Just before they go to bed fattening swine commonly take a long, deep draught, and to deprive them of this is a serious matter. Care should be taken to have the water trough full late in the evening. In fact, the most economical arrangement is that which keeps water from a well always in the trough by means of an automatic windmill pump.

DOES BUTTER PRODUCTION EXHAUST VITALITY?

WEBB DONNELL, MASSACHUSETTS.

The assertion has recently been publicly made that the enormous yields of butter with which certain dairy cows are credited, is of no interest to the ordinary farmer, since such yields are abnormal and so extremely exhausting that there is loss of vigor both in the cow and in her progeny.

The facts show that the records of great production have been followed by years of continued large yields, and that the cows which most distinguished themselves in the dairy are the very ones that have produced the famous butter cows and bulls of succeeding generations. This certainly refutes the idea that there is loss of vitality. There are dairy cows with well authenticated butter records of 680 pounds, 751 pounds, 945 pounds, and 1,047 pounds each per year. Signal's Lily Flagg yielded the last amount.

It is very commonly supposed that animals of various kinds can be forced to go beyond nature's limits by a system of high feeding; that hens can be forced to lay large quantities of eggs, and cows to secrete great yields of milk or butter fats. Unless certain drugs are used to produce an abnormal activity of the secretory organs, animals never exceed their natural capacity. In fact, very few come up to it, owing to the lack of intelligent feeding.

With the conditions of climate, care and surroundings perfect, a cow will give the maximum amount of milk, or butter, of which she is capable when she is fed upon as much of a well-balanced ration as she is able to digest. A dairy cow is a very complex machine for turning feed into butter, and to get the most profit from this machine it should be run at its full capacity. The great trouble with a large percentage of our dairy cows is that they have not capacity enough to afford any margin of profit, even when producing to their utmost limit.

Cows constitutionally inclined to secrete large quantities of butter fats are needed, and no one need fear that these can be injured by getting the largest possible returns from them by skillful feeding. These large yields that are reported are of vital interest to every farmer who owns a dairy, since they show the value of breeding in butter lines, and also show the necessity of feeding proper foods in proper quantities, that the cow may be as productive as nature designed her to be.

Give the Horse a Bath.—Nothing so refreshes a tired animal, biped or quadruped, as a bath. The profusely perspiring horse discharges an enormous quantity of waste matter through the skin, and the odor of it is as bad as that of the manure, being strongly ammoniacal. This attracts the pestiferous stable fly, which so disturbs the rest of the horses at night. A drenching of cool water, and an immediate rubbing down of the skin, will be a double relief to the wearied animal. It will refresh him and relieve him from its tormentors. A covering of wire gauze on the windows and doors of the stable, and a cooling of the floor and walls with water, with a clean bed, is the least any conscientious man should provide for his faithful horses. Street car horses are sprayed at each rest.

ALFALFA IN ARID NORTH AMERICA.

J. L. TOWNSHEND, UTAH.

Twenty-five years ago the Mormon farmers were experimenting with alfalfa clover, or lucern, to learn its value for the Rocky Mountain deserts. Small plats were planted on the farms and treated like red clover, but it was found difficult to plow under and unsuited for a rotation of crops. Its long roots penetrated the deep loams from fifteen to twenty-five feet in search of moisture, and when it was found to be especially adapted to our dry upland soils, many thousands of acres of wild lands were soon cleared of sage

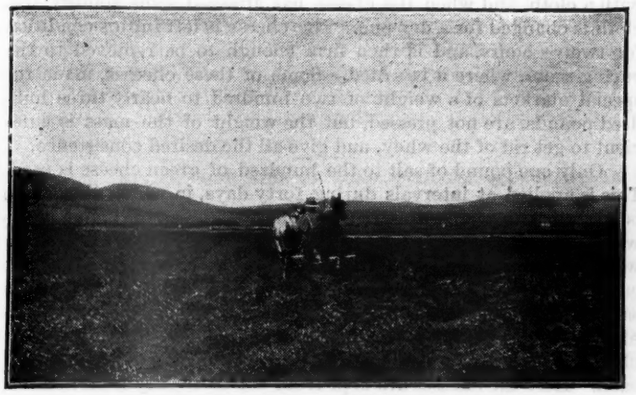


FIG. 1. MOWING ALFALFA CLOVER.

brush on the mesas, and of rabbit brush and greasewood on the lowlands, and large areas were sown to alfalfa, and the arid desert reclaimed. The farmers were excited with prospects of great wealth. Nearly all other improvements ceased for a time in the rush to secure and plant these desert tracts which before had been considered quite worthless. At first, only those lands were selected on which the waste high water could be used for irrigation. As the demand for the seed grew with the excitement, it was discovered that the alfalfa, grown on dry lands where the stand was quite thin and the plants scattered, yielded more seed to the acre and of better quality. So high up on the bench lands, into the foothills of the mountains, up the little ravines into the larger canyons, and far up into remote mountain parks, its culture extended, until every farmer depended on his alfalfa field for hay and on the seed for a

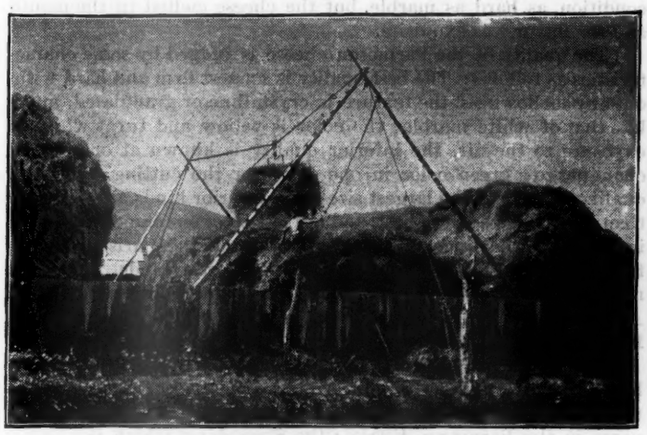


FIG. 3. STACKING ALFALFA HAY.

cash income. Now over large areas the prevailing gray-green color of the sage brush desert has changed to the emerald green of the alfalfa fields, which stretch for miles and miles as sources of wealth.

The ground is prepared for alfalfa by first cutting off the desert growth of bushes with a grubbing hoe or mattock, the brush being piled and burnt. If the tract is to be irrigated it is plowed and leveled and laid out with ditches. If it is a dry-land field the seed is perhaps sown without plowing, the harrow alone being sufficient to cover. Some farmers drive a herd of sheep over the newly harrowed field, or roll it with a toothed field roller, the alfalfa making a better stand on the indented soil. On the mesa, or upland, the seed is sown whenever the conditions of soil and weather permit, from January to April. On lowland where frost would be liable to kill the young plants the seed is generally sown broadcast, early in May. Fifteen pounds of alfalfa seed is usually sown to the acre on the lowlands and twenty pounds on the upland where much of it never germinates, or the young plants perish before the roots have grown deep enough to stand the drouth of midsummer. The seed is sown broadcast by hand, or with a broadcast seed sower. A good sower, on foot, plants twelve acres a day by hand, and thirty acres a day on horseback. Unlike red clover, alfalfa does not attain its full growth the first year but requires about three years to become fully established. It is a perennial plant, and lands seeded twenty years ago are still in good condition and will probably remain so. The sturdy alfalfa grown on irrigated land is cut for hay three times in

FIG. 2. IN THE ALFALFA FIELD, THREE TONS PER ACRE.

a season. The first crop is cut when in full blossom, about the first of June. The second crop is ready for cutting from thirty-five to forty days later, and the last crop about the tenth of October. The first crop yields about three tons per acre, the second about two tons and the third about one and one-half tons. Dry land alfalfa is cut twice in the season, yielding each time one ton or more to the acre. Alfalfa cuts easier than timothy. It is quite succulent and to cure it the horserake is used to rake it into windrows and then into bunches, or, where very heavy, it is placed in cocks by hand. It usually requires three days to dry, but if allowed to get too dry, the leaves drop off in handling, much reducing its value. It is hauled in immense loads to the stackyards either in the fields or near the ranches, and stacked in long ricks of twenty-five to one hundred tons. For seed the second crop is left till the pods are fully

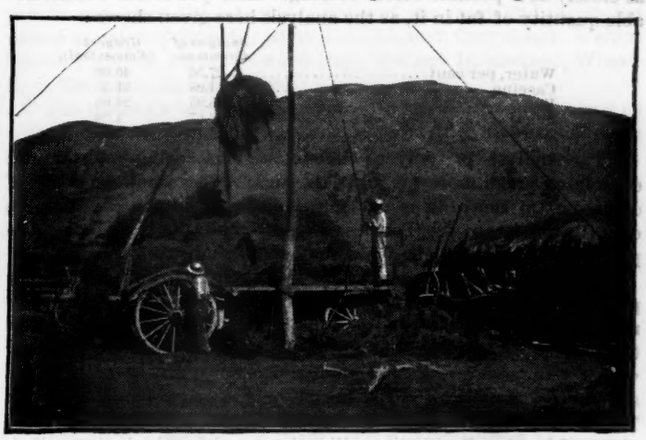


FIG. 4. STACKING ALFALFA ON THE MESA.

ripe when it is cut and cured. It is then threshed with a grain separator with clover huller attachment, after which the seed is sold to the local buyers who clean it and grade it for market, using a fanning mill with special screens for the purpose to remove weed seeds. The crop of seed varies with the humidity of the soil and quantity of plants to the acre, an acre yielding from 250 to 400 pounds. The dry uplands produce the most seed. In former years the price was as high as twelve cents a pound. It has steadily declined with the increased supply until now it brings in the open market but five cents per pound. The chaff and straw after threshing are nearly as valuable as hay for stock, though somewhat dusty.

Alfalfa hay is relished by horses, cattle, sheep and swine. Horses thrive well all winter when given access to a stack where they can feed themselves, and, during the working season, the farm

horses usually receive no other feed. It is a good feed for brood mares which when fed on it, give an abundance of milk for their foals. It proves to be a strong food for stallions, keeping them healthful and vigorous. Very poor and overworked horses soon gain strength from it and in a month or six weeks can recuperate and work daily on alfalfa hay alone without grain. As a food for stall-fed cows it is excellent, causing a large flow of milk, rich in cream and butter. Large quantities are baled and shipped to the local mining camps and into surrounding States. Even swine will eat it. Alfalfa makes excellent pasture. After the second year it will support cattle, horses, swine and poultry. When it is about four inches high, from twelve to fifteen shoats to the acre can be kept thrifty and in good condition. Cattle do well upon it but must be accustomed to it gradually to prevent hoven, as they eat it greedily. It is quite dangerous when covered with dew or hoar frost, bloating so powerfully as to produce the sudden death of the cattle.

As an orchard crop it thrives under the trees, yielding one good cutting in the season. When once in possession of the soil it holds the ground against all weeds except the common dandelion which alone has power to dispossess it. The alfalfa fields provide an excellent pasture for bees, and bee culture has grown to be a very profitable industry in Utah. Lucern is now much used along railroads and irrigation canals to fix permanently the drifting sands that tend to fill the excavations. In sandy tracts, once utterly devoid of vegetation, it has proved able to reach moisture, and thrive luxuriantly. [Our illustrations on the preceding page, engraved after photographs, depict the various operations in harvesting alfalfa.]

PARMESAN CHEESE.

HENRY STEWART.

Parmesan cheese takes its name from Parma, which was formerly one of the provinces of Italy, where a special kind of cheese was made that had gained a wide reputation as long ago as the year 1509, when one of these cheeses was presented to the French king at that time. It was here, and in connection with this manufacture, that the first coöperative dairies were organized, and they have been in existence ever since, as a means by which the manufacture of this and other kinds of cheese is made possible, because of the smallness of the individual dairies and the large size of the cheese. This cheese is an example of what may be done by skillful adaptation of the various changes that occur in the nitrogenous part of the milk during the process of curing. It is made from skimmed milk, at least the milk is skimmed about as closely as is possible before souring. And yet it has a considerable quantity of fat in it, as the analysis here given shows:

	Analysis of Parmesan.	*Gruyere (Emmenthal).*
Water, per cent	27.56	40.00
Caseine	44.08	31.50
Fat	15.95	24.00
Sugar	6.67	1.50
Ash	5.72	3.00

The analysis of Gruyere cheese is given, being moister and containing much more fat and less sugar. The small quantity of cream left in the milk is not sufficient to make the considerable quantity of fat in the Parmesan cheese, but this is added in the process of curing, which, as we shall see, occupies a long time.

Parmesan cheese is large, not less than from sixty to seventy pounds and up to two hundred or more, and the comparative dryness gives the unusual weight and solidity. It has been found that the process of fermentation will not go on in a satisfactory way with a less, or a larger, size than this. For a cheese of this size about nine pounds of milk to the pound of curd is required. The milk is heated to 110 degrees, the rennet is then added and thoroughly stirred with the milk; the vessel in which the milk is set is then removed from the heat and the milk is left to curdle. Sufficient rennet is used to bring the curd in half an hour. The high temperature makes the hard curd required.

The curd is then completely broken up by stirring with a beater much like those used here for beating eggs. There is no risk of loss by this, for there is no cream to be lost. The curd is then heated to 110 or even 120 degrees, in a cautious manner, and stirred and beaten and squeezed by the hands until it becomes glutinous and sticky. This is an important part of the work, for the special character of the cheese depends upon it. The cheese is of a hard, flinty texture, and is not eaten as other cheese is. It is used in cooking, for flavoring pastry and vegetables, and other uses, for which purposes it is grated. For such use it is obvious that a soft cheese would not do. Thus the manufacture is such as to produce this hard firm consistence, that it may be reduced to a fine dry powder for its special uses. When the curd is in this stage of the process it is colored with saffron to such a shade as the maker desires, the color varies very much, and some of the inferior makes are quite without color except the natural greenish tinge of the curd. During the heating, the workman continually tries the curd with his hands to test its quality and the ability of it to form a firm solid mass when pressed in the hand. When this viscosity is properly developed, the curd is removed from the fire, and drained from the whey. It is then put in the molds and submitted to pressure, at first gently and then increasing; the mold is filled above the edge so as to bring the curd to the edge when it is sufficiently firm to retain its weight and shape. When put in the mold this is lined with a cloth, and when the cheese has attained some solidity this cloth is changed for a dry one. The cheese is left in this condition for twelve hours, and is then firm enough to be removed to the curing room, where it is salted. Some of these cheeses, made for special markets of a weight of two hundred to nearly three hundred pounds, are not pressed, but the weight of the mass is sufficient to get rid of the whey, and give all the desired consistence.

Only one pound of salt to the hundred of green cheese is used. This is applied at intervals during forty days, in which the cheese is rubbed with the salt and turned, at first, every day, but afterward only every third day. During the curing, the cheeses are wiped dry, scraped free from mold, oiled, and treated with great care to prevent the surface from drying or cracking. From the salting room the cheese is taken to the curing house, where it is exposed to a cool, regular temperature, where the air is not changed suddenly, and is ranged in accordance with the age of each. Here the cheeses are kept from six to twenty-four months, the latter age being that at which they are in the highest perfection, but some are kept a full year longer before they are in the finest condition. The slow fermentation thus undergone does not produce that rank odor which some cheese acquires during long curing, for the small proportion of fat in it does not produce an excess of the butter acids, and the curing tends more to absorb the added oil rather than to decompose the natural fat they originally contain. The whey which is expressed from this cheese is quite thick, as may be readily understood; this is made into a soft kind of cheese called "ricotta," which is sold at a low price to the poor people who eat it with their coarse bread. The season of manufacture is from April to October; the best cheese is made in May and June; the May make always brings the highest prices. The peculiar method of manufacture gives this cheese a long endurance, one experiment made in keeping the cheese for twenty years showed that at the end of this long time it was in perfect condition, as hard as marble, but the cheese melted in the mouth and the flavor was exquisite.

The quality of the Parmesan cheese is judged by some characteristics as follows: The best quality is soonest firm and hard without any mellowness, the texture is crystalline or granulated, much like that of white marble; the color is yellow and turns white on exposure to the air, the inferior quality is known at once by its changing to a green color in one day after the cutting. The best quality is made in the largest sizes; the inferior kinds are not more than half the size of the best, and are less than one hundred pounds in weight. The price of the best quality in the Paris market is from thirty to fifty cents a pound, the poorest kinds, which are mostly sold in Italy, sell at half this value. In England and America the price is $1.00 per pound for the grated cheese, and but little less for the solid cheese.

The Italians make several other kinds of cheese which are highly popular, as the Gruyere, made in the northern provinces on the Swiss border; the Gorgonzola, made near the town of this name in the Parmesan district; the Stracchino, which is a cream cheese, and claimed to be the best in the world; the Cacciocavallo, which is made of cows' milk, although the name would indicate that the milk of the mare is used; the Provoli, made of the milk of the buffalo, and the Provolini, made of cows' milk. The Provoli are smoked by burning aromatic herbs under them, and have a flavor not unlike that of a very fine ham. They are small and sell for thirty to forty cents per pound.

To Eradicate Ox-Eye Daisy.—Timothy is often crowded out by the ox-eye daisy (*Chrysanthemum*) which grows tall and seeds before the timothy is ready to cut. Close pasturing through spring and summer, with frequent mowing, will check the vile weed which contains only three-fourths as much food as clover. Some farmers crowd out the pest by seeding hay grasses which mature sooner than timothy. The Orchard and Tall Oat grasses are earlier.

TEN-BLOCK SYSTEM OF NUMBERING COUNTRY HOUSES.

DICE MCLAREN.

Much of the isolation of the farmer is caused by the time consumed in finding his residence. A certain numbered house on a certain named street makes one at home in town, but the farmer is a stranger in a strange land when seeking a fellow-farmer in an adjoining county. Communication between farmers is extremely

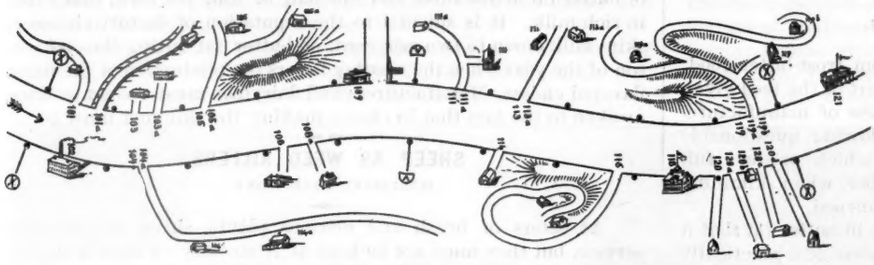


FIG. 1. ONE MILE OF ROAD WITH TEN-BLOCK ENTRANCE NUMBERS.

inconvenient because of the extra cost of finding the destination of a message, package or telegram. Concerted action is very difficult, the merchants and office-seekers who know the roads, being masters of the situation, and the interests of the farmer suffer.

Contra Costa county, near San Francisco, California, has named all its country roads, and is measuring and dividing them into ten imaginary blocks to the mile. In January, 1890, the semi-weekly county newspaper advocated naming the roads, and numbering the country houses. The well-known fruit grower, A. L. Bancroft, suggested a called meeting of public-spirited citizens at Oak Grove schoolhouse, and there presented a working plan. There were meetings in other schoolhouses, and two at Martinez, the county seat. A committee of five, with Mr. Bancroft as chairman, was delegated to continue the work. The committee formulated an ordinance and secured its enactment by the county board of supervisors. The roads were named in as long lengths as practicable. Names of towns and living residents were not used. Some landscape feature, some historical association suggested the name. Bear Creek Road, Lime Ridge Crossing, Lake Connex, Mountain Drive, Walnut Way, Vista Rio, Granger Exit,

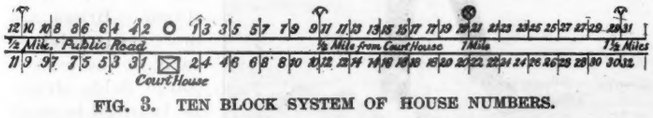


FIG. 3. TEN BLOCK SYSTEM OF HOUSE NUMBERS.

and Happy Valley Local, are examples. A list of the roads was made, beginning with those going northward from the county seat, followed by those going easterly, those going southerly, and those going westward. Lists and names were published in the newspapers. As Contra Costa county, at public expense, merely records

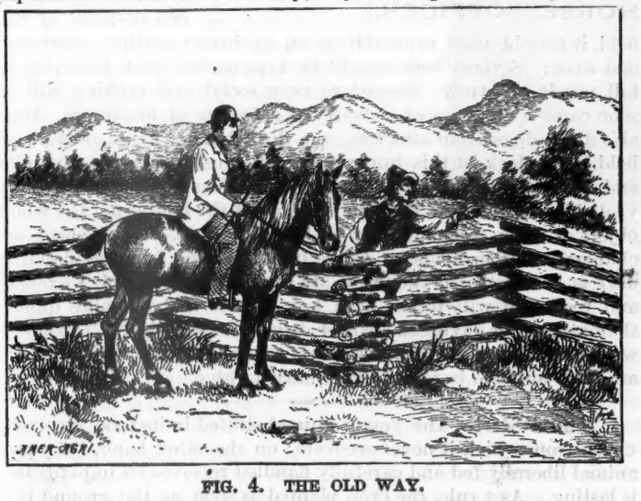


FIG. 4. THE OLD WAY.

the surveys and erects guideboards, the committee has solicited subscriptions and is now measuring the roads and numbering the houses. The measuring begins at the center of the street just in front of the court house, and proceeds along the nearest line of travel. The village streets have the customary 100 numbers to the block, but outside the limits, the country house numbers are used, two to each block of 528 feet (thirty-two rods) of road. The odd numbers are on the left hand going from the court house, the even numbers on the right. A gate on the right hand side, with its right post three and one-tenth miles by road from the court house, is thirty-one blocks distant, and is in the thirty-second block. Hence, its road number is 64, or twice 32. A gate just across the road would be numbered 63. Half the even numbers of a block divided by ten always gives its extreme distance from the beginning. Each house has the number of the block upon which its gate or entrance is located, as 64 for the first house. Other houses, built on the same block, take the numbers 64a, 64b, to 64z. On the fence, or a post, a line is placed showing the numbers and the division between blocks. On the right is 64 | 62. On the left is marked 61 | 63. At the end of each mile (ten blocks) an X is painted inside a circle. The half mile is marked by a V in a semi-circle. There are twenty road numbers to the mile. A permanent committee of three public-spirited citizens, to serve without pay, has been appointed and confirmed by the County Board of Supervisors, to propose names for new roads, and to see that the work of establishing and continuing the system is properly maintained. Thus, the work is permanent, and new houses can, at any time, have numbers assigned them without interference with other house-numbers. Village-numbers supersede house-numbers. The

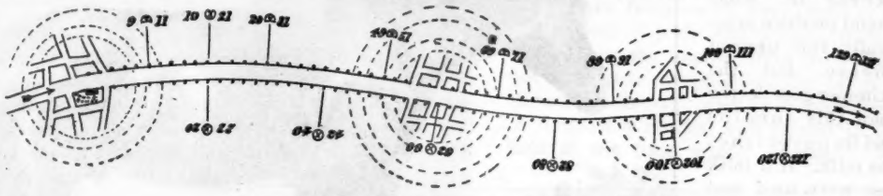


FIG. 2. VILLAGES ENLARGING ON A TEN-BLOCK ROAD.

Old World custom of naming farms and country places is now being strongly urged in Contra Costa county. The county paper prints a list of the names already given to the farms. Though the home may change owners, the farm name is permanent, and is used to locate the new occupants. The name glorifies the home, exerting a constant influence for good upon the neighborhood, upon its people and upon their homes. Many of our ranch and plantation names are appropriate, as: Riverside, Calumet, Currycomb, Walnut Grove, Prospect Farm, Pawnee Gap, Herbert Homestead, Wheatland, The Oaks, and Meadow Brook.

The ten-block system works as well with houses miles apart as with those closer, even to twenty feet apart. The distance between any two house numbers in the country can be easily reckoned. The homes of farmers can be quickly found. Strangers can be given clear directions. The mileage of officers can be quickly

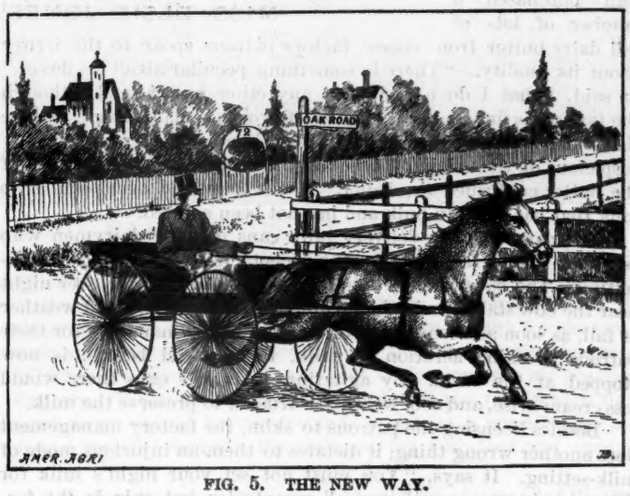


FIG. 5. THE NEW WAY.

calculated. Road work can be accurately located by its block number. A county directory would be printed immediately with farm names and road numbers of every citizen. The Postmaster General has declared that the ten-block system of numbering

country roads would remove the only obstacle to rapid and accurate free postal and telegraph delivery to farmers.

[Our readers should carefully study the Contra Costa county road ordinance printed in this number, which covers every detail of the new system. Many of the features are clearly illustrated in the engravings on the preceding page, which are drawn from sketches sent us by A. L. Bancroft.]

FALL-MADE BUTTER.

GEORGE E. NEWELL, NEW YORK.

Finely-flavored butter cannot be made from frost-bitten food. The character of the butter will be a counterpart of the feed given to the cows, modified, of course, by the process of manufacture. Many dairymen make fall butter on the following questionable plan: They are patrons of cheese factories which produce full cream stock until about the middle of September, when skimming off the night's milk begins, and this cream is churned.

The fallacy that milk in autumn is so rich in butter fat that it may be partially skimmed and still produce cheese of a practically full stock quality, is generally believed. The skimming is done at the dairyman's home, and the milk is set in the deep cans used for factory delivery. The practice is very pernicious to both good cheese and butter making. In most instances, a small excess of butter fat does exist in fall-produced milk, an excess of what would produce practically full cream cheese, but the skimmer goes deeper than this surplus and impoverishes the milk. If a milk test were used and all cream taken from autumn milk above three and one-half per cent., the cheese manufactured therefrom would be an honor, and not a disgrace, to the factory brand. While inferior cheese is produced by the mode now practiced, inferior butter also results. A well experienced butter dealer who had purchased a number of lots of fall dairy butter from cheese factory patrons spoke to the writer about its quality. "There is something peculiar about its flavor," he said, "that I do not taste in any other butter, and although the texture is fine and firm, the bad flavor is so damaging a feature that I have lost on those lots I have handled." I was instantly suspicious of the origin of this bad flavor, and an olfactory test of the butter confirmed the belief. It was that fetid odor peculiar to milk that has stood in bulk and has not been aerated.

MISS ELSIE JONES'S HORSE "OFFICER."

The narrow, deep delivery milk cans used by dairymen who patronize cheese factories are the receptacles used for night milk-setting. The cans usually stand upon the milk wagon over night near the cow stable, or in the farmhouse yard. In the cool weather of fall, as soon as license is given by the factory managers for their patrons to skim, aeration of milk, if practiced before, is now stopped at the farm. By agitating it in the cans there would less cream arise, and cool weather is trusted to preserve the milk.

Besides licensing the patrons to skim, the factory management does another wrong thing, it dictates to them an injurious mode of milk-setting. It says, "You must not set your night's milk for skimming in pans, or other small receptacles, but only in the factory delivery cans." This is to prevent a larger amount of cream from being removed. The result is that the hot milk poured into the cans—a hundred pounds or more in each—does not become quickly reduced in temperature, even if the weather is cool, and the cream arising forms a thick blanket over it to still further retard the escape of heat and to favor damaging animal odors.

The materials retained in milk, not aerated, result in decomposition and taint, and this taint impresses its execrable flavor upon the cheese made from the milk, and the butter produced from the cream. The use of the skimmer and of the separator in cheese making must be prohibited, unless it be to remove the small surplus of butter fat above three and one-half or four per cent. that exists in rich milk. It is suicidal to the reputation of factory cheese to skim milk down to two per cent. of butter fat during the cool season of the year when the weather favors the production of the finest flavored cheese. Manufacturers and dairymen must, sooner or later, awaken to the fact that in cheese making the skimmer must go.

SHEEP AS WEED KILLERS.

HOLLISTER SAGE, CONN.

As eaters of brush and noxious plants, sheep will do good service, but they must not be kept at it steadily, or they will grow thin, and their fleeces will suffer in consequence. The flock must be compelled to browse only a few days at a time. After the gratification of this diet ceases, there is no longer profit in confining sheep to such food. No other live stock demand more constant change. If the sheep be divided into several flocks, one may follow another into a field where brush or weeds are becoming troublesome, and each returned again after a week's relief on grass. Most plants can be killed by removing the leaves during the summer. The bushes should be cut down, that the flock may destroy them by eating every new sprout. Briers are more easily subdued early in the season. Large fields should be browsed in small plats by means of movable fences. When grass has taken the place of brush or weeds in one division of the field, it may be used profitably as an exchange pasture, every second week. Several bells should be kept on the flock browsing in tall weeds or brush. Sheep are very social, and nothing will so soon cause a cessation of industry as a feeling of loneliness. Bells also deter dogs from attacking the flock hidden in an overgrown field. The flock at this important work must also have a regular and abundant supply of pure water and of salt, and be frequently visited by the owner. That the cleaning of the land is not the whole object of sheep keeping must be borne in mind. When sheep are changed to other fields, or to the fold, the time from sundown to dark is preferable, as then they are satisfied with the day's exercise and food, and will follow with less trouble and lie more quietly than at noon or daybreak. Never drive a flock roughly. The sheep, which are always led, make the best grade of meat, and the fleeces are most uniform in texture and market value.

A Good Start.—The young animal stinted in its food receives a check from which it never recovers; on the other hand, the young animal liberally fed and carefully handled receives an impetus that is lasting. As a rule, the crop planted as soon as the ground is in fit condition makes the best crop. The grass cut at the earliest seasonable moment makes the best hay and is saved with less risk. The vegetables shipped to the market as soon as ready sell the best.

A FAMOUS CANADA DAIRY FARM.

Near Brockville, on the Canadian side of the St. Lawrence river just below the beautiful Thousand Islands, is Belvedere, the famous Jersey dairy farm of Mrs. E. M. Jones. The accompanying illustrations present views of the barns, the residence and some choice specimens of the pedigreed stock. The owner is a practical business woman, managing the farm herself, being able, should necessity arise, to milk, separate the cream, churn, work the butter and prepare it for the regular customers.

By strict personal supervision and attention to every detail of the farm, the dairy and the market, Mrs. Jones built up such a reputation for her butter in the New York market that it was eagerly

BELVEDERE.

bought at $1 per pound. But at present the increased tariff causes the yearly output of 7,000 pounds to be more profitably sold to one company in Canada. The herd comprises about fifty of the very best animals obtainable. All are thoroughbred, but actual merit as shown by good butter records, is needed to secure an animal a place in the herd. As the home dairy farm contains only eight acres of poor, stony land, two other small farms are rented. Soiling is practiced, as there is no good pasture land within reasonable distance, the intensive farming followed furnishing immense quantities of green food. Besides the crops used for soiling, the small farms annually produce about sixty tons hay, twenty acres corn-fodder, 1,000 bushels oats, 1,000 bushels roots and all the fruit and vegetables needed by a large household. Lately a few choice horses have been added to the stock, among which is "Officer," a noted $1,000 saddle horse whose portrait appears on the opposite page. The cattle, however, are the special pride of the farm. At the head of the herd is "Canada's Sir George," the famous St. Lambert Jersey, and second to him is "Massena's Son," sired by a pure St. Lambert. The dam, "Massena," gave, in her sixteenth year, 8,290¼ pounds of milk which yielded 654 pounds of butter. Many costly prizes have been won by "Canada's Sir George" and "Massena's Son." Three of the Jersey cows have yielded a profit of forty-seven per cent on the value of food consumed and all the herd give good returns, being excellent butter producers.

Eighteen years ago the Belvedere herd began with two Jerseys tethered on the lawn, and a few pounds of butter were sold to a neighbor. The wonderful growth of the business under Mrs. Jones's successful management has brought many requests that she write a book on the dairy and dairy farm. The world would be glad to know how this kind of farming pays and how one woman has made it pay, by personal supervision winning deserved success.

BARNS AND BARNYARDS AT BELVEDERE.

BARNYARDS.

Barnyards, as usually arranged, are about twice the size needed for the economical saving of manure, and that should be a consideration of vital interest. As generally managed, very much of the accumulations of barnyard manure, left exposed to the elements while in the yard, are reduced in value, in consequence of the exposure, or from being scattered thinly over too large an area, and trampled into the soil during inclement weather. There is often connected with a barnyard a lane that leads back to other fields of the farm, or to a creek where the stock obtain their water supply. To this lane the stock often have free access, and wander up and down this avenue hundreds of times each winter, to pick a little grass that may be exposed along the fences, sometimes because they are driven there by their stronger companions, or to sun themselves during pleasant weather, or simply to exercise the freedom offered them. Many dollars' worth of the most concentrated farm fertilizer is thereby lost to the farm each year, and to all the remedy is plain and simple. Instead of throwing the manure from the stables out under the drippings of the eaves, it should be thrown under a permanent or temporary shelter, and hauled to the field at any time, winter or spring, and placed in heaps over the surface of the farm. There should be sufficient shed room or a basement commodious enough to shelter all the stock comfortably, and keep them spending most of the winter under said shelter. A barnyard large enough for the straw stack and a fifteen foot space around that, before the fences or buildings are reached, is of sufficient dimensions for all practical purposes. When buildings do not border on the yard a high tight board fence should be constructed, to act as a wind-break, and prove a grateful shelter to the stock, saving both feed and manure.

Adjusting Harness.—A harness should be so arranged that the traces can be adjusted up or down to meet the line of draft. Thus the pressure upon the shoulder may be evenly distributed. This is very important if the team is to do heavy work. In plowing, har-

rowing, and similar work where the line of draft is low, let out the back band to such a length that when the traces are straightened there will be no pressure, or pulling down upon the back. For general farm work, a back band made from cloth is preferable to one of leather, being much lighter and cheaper. The lines should always be strong, and so adjusted that when drawn tight the heads of both animals will be straight with their bodies, and not pulled together or thrown apart. Such out-of-line positions make the steady work of the farm horses much more difficult and tiresome.

TREAT THE COWS KINDLY.

Cows are naturally of the mildest disposition of any four legged animal upon the farm, and they should be treated kindly and not abused by the milkers and drivers. The practice of sending a dog after them and allowing him to rush them into the milk yard, exhausted and excited, is a practice that will cost each year from ten to twenty-five pounds of butter for every cow milked. Drive the cows leisurely to and from the pasture. If you are in a hurry let the driver make double quick time when he is going to and from the field not accompanied by the cows. The throwing of stones, sticks or other missiles should be forbidden, and the operation of milking should be done rapidly and with but little or no talking. Should a cow make a misstep or switch you unpleasantly during fly-time don't speak so sharply as to startle her. In many herds there are often one or more cows which only a certain member of the family can milk. This indicates very plainly that some one is mild tempered, and understands the cow's disposition.

A box located at some accessible point should contain at all times a supply of salt. If salt is fed in heroic doses once or twice each week, the cows will then gorge themselves, causing derangement of the digestive organs. Milk should not be applied to the teats to reduce the power required in milking, for it does not, but most certainly adds filth to the milk obtained, and in cold weather the wet teat will become cracked and sore. All cows with a domineering nature and sharp horns should be dehorned. Brass ferrules at the tips of the horns lessen the danger but do not prevent the pushing and bruising of other cows.

SILOS IN COLORADO.

JOHN GOULD, OHIO.

An AMERICAN AGRICULTURIST reader desires information on several points about the construction and management of a silo. "Is a silo ten or twelve feet square practicable? Would it be as well, or better, to build it partly underground—the land being level and no facility for draining? What size of timber and studding would be required to make the walls of sufficient strength? What kind of boards would be most advisable for the sides and bottom? Not having a machine for cutting, would it be advisable to put cornstalks in whole, or would it be better to cut them in pieces of about six inches in length?"

There is no objection to a silo ten or twelve feet square, if it is sixteen or eighteen feet deep, so as to overcome the friction of the sides, which is as great in a small as in a large pit. The deeper the pit, the better the stalks will settle, and the more compact the silage and its corresponding keeping.

Where the land is level, it would be a serious objection to build the silo partially under ground, and all the more so where there is no drainage; for unless the lower part of the pit was most thoroughly built of the best masonry, the surface water would get in, and do serious damage to the bottom strata of silage. The better way is to build a low stone wall, and "shoulder" the ten-inch sills into the inner face of this wall, having this wall come up a foot above the surface of the soil. This stone work has to be strong, and well secured, as the pressure at the bottom will be pretty heavy. In a dry, firm soil a twelve-by-twelve inch timber bedded into a trench of like size, first painting it well with gas tar, makes a fair foundation, the studding being toenailed to it. Drainage has to be provided by either making the trench some sixteen inches deep, and putting in four inches of pounded stone below the sills, or by a small drain tile put immediately under the sills.

If the silo is only of the size mentioned, two by eight inch studding, set sixteen inches apart from center to center, would be sufficient, but if it is located in a barn two-by-sixes would be of ample strength. Some silos are now built by studding horizontally, instead of up and down, and "locking" the studs at the corner. In this case, the lining boards go up and down, and are either double or single, as the builder may prefer. If a corner brace is used, the sharp inside corners are thus avoided, and the silo is much stronger. The lumber used need not be of the very best quality, so long as it is sound, free from cracks and shake knots. If the silo is to be single-boarded, which some now claim to be the best way, it is better to use boards not over four inches wide, and well matched. They should, in this case, be put on grooves up, and these grooves filled with thick paint of some kind, as fast as they are put in place, and the whole interior then thoroughly painted with waterproof paint. Good hemlock or pine barn boards make a good wall. If a double wall is preferred it should be a foot wide, of barn lumber, put on with a half lap, and lined with paper.

I am not in favor of putting cornstalks into a silo, whole, and if they cannot be cut by machinery, chop them into the six inch lengths. It is very difficult to properly feed a dairy whole stalks, as the cows throw and muss them so in their attempts to get all the ears of grain that the stalks bring to them, and the loss in wastage is too large for profit. If they are cut up so that each cow gets and consumes her portion, it will be all eaten, and with profit.

Where the foundation is firm clay, and the depredations of rats are not to be feared, a silo with concave bottom hollowed out of the clay itself, and carried up for six or eight inches against the walls above the sills, and firmly pounded down, makes a good floor. Some pound down a few inches of stone, and plaster it with cement. I have both kinds, and prefer the pure clay floor, as not only the cheapest, but in every other way equal to the cement, though in other localities a grouted floor would, no doubt, prove to be superior.

FEED THE STRAW.

In all industries, the use of the bye-products is a great source of profit. The straw in grain growing has much food value. To cure straw in the proper manner the grain is housed in good condition, or is so stacked that the weather will affect it but little. When threshed, it is put up in neat stacks which will shed rain, or, if possible, placed under shelter. If in stacks, when the feeding season arrives it is so cut down with the hay knife that only a portion of it may be uncovered at a time. This applies more particularly to oat and barley straw, the feeding value of which for farm stock is considered to be worth half as much as timothy hay, pound for pound.

If about two quarts of fine salt per ton of straw be applied to straw at threshing time, it will make it more palatable than if not so applied, or, in feeding, a weak brine may be sprinkled over it, when the stock will eat it with more relish.

The beards of barley straw are considered by many objectionable especially when the stock is allowed to feed from the stack, or from racks in the open air where the wind whisks the beards about, often endangering the eyes of the animals. Should a beard lodge in the eye, a pinch of fine salt thrown under the lid will cause a copious discharge, and the impediment is usually thus washed out, but if not, a second application will remove it. Most of the beards can be separated from barley straw by removing, at threshing time, a two-inch cross section from the straw carrier allowing the beards to fall through. The chaff is a valuable constituent of the oat crop, and should be carefully preserved for feeding purposes.

WHEAT AND RYE ON CORN STUBBLE.

Many farmers plant corn stubble to wheat and rye, and are usually in such a hurry that three rows of shocks are placed together and the balance of the field sowed. This plan necessitates running over the seeded land to secure the corn and stalks, but the worst feature is in leaving unseeded strips across the field, which are useless to the crops. Weeds are allowed to take possession of the strips, and, until the crop of grain is gathered, the field indicates the shiftless farmer. It is not much trouble to haul off the shocks to the barnyard or to an adjoining field, setting them up in rows. They are then more easily husked. The husked corn is nearly all in a body, and is more easily secured. The stalks and all litter of leaves and husks are then more easily gathered up and saved for future use. The grain and straw that can be produced on these strips will repay many times the expense of hauling off the stalks. If possible, haul the stalks to a pasture, or meadow lot, and thus insure cleanliness in husking. Stock will eat the broken leaves.

Pure Water for Stock.—Live stock should be furnished with pure water. If they are now obliged to quench their thirst for the greater portion of the year from a pond or slough hole, this condition should be changed by the use of a well and pump. The water can be raised cheaply and in sufficient quantities by a windmill.

BEAUTIFUL CAPE FLOWERS.

The species of *Babiana*, *Ixia*, *Sparaxis*, *Tritonia*, and other genera, are popularly known as Cape bulbs, from the fact of their being indigenous to the Cape of Good Hope. Theyare all of the same general habit, remarkable for their ease of culture and their strikingly showy flowers. Their cultivation is of the most simple kind. In their native home the year is divided into a dry and a rainy season. During the one the earth is saturated with moisture, and the temperature rather cool, while during the other the soil is dry and parched. These bulbs seem to require the same conditions wherever they may be grown. Therefore, when the bulbs start into growth, they should have plenty of water and sun, and be kept vigorously growing until after the flowers have faded, then they have to be dried off gradually, by giving them less and less water, until the foliage withers. The pots should then be put in a dry, warm place, and the bulbs allowed to remain undisturbed until another season of growth, when the bulbs have to be separated and repotted in fresh soil. The soil to be preferred is a rich, sandy loam. They may be potted from September to December, and, if brought forward at different times, a succession of bloom may be had from February to April. Water should be freely applied with a syringe, to keep the red spider from these plants. The Babianas grow from six to twelve inches high, and produce spikes of brilliant flowers, ranging in colors from blue suffused with white to the richest crimson magenta. In general appearance they somewhat resemble the Gladiolus, and many of them are sweet scented. The bulbs are a favorite food of the Hottentots, and are said to have the flavor of the sweet chestnut when well roasted. The Ixias have long, narrow leaves similar to the Iris, to which natural order all these bulbs belong. The flower spikes are slender, sparingly branched, and the flowers are large and showy, varied in color, and exceedingly attractive when fully expanded by sunshine. Five or six bulbs may be grown in a six-inch pot, and, for good effect, but one color should be planted in a pot. Like the other kinds of this class, they have to be kept cool, with plenty of moisture, and free sunlight to give intensity of color to the flowers. The Sparaxis are lovely plants, with tall and graceful flower stems, strong and wiry, much branched, and well furnished with deep, rosy, foxglove-shaped flowers. There are, also, varieties with striped and nearly white flowers, but the former color predominates. They grow best in a cold frame. The Tritonia far surpasses the others in beauty and usefulness, either as a house plant or in the greenhouse, or for growing in a frame for early spring flowers. *T. aurea*, now known as *Crocosmia aurea*, is a beautiful flower, and popular in English gardens, where some flower-lovers prefer it even to the Gladiolus, as it is not so stiff looking, and keeps longer in bloom; besides, it looks well from the day it is planted, with its graceful, drooping, ribbon-like leaves, which are worthy of a place, even though it never flowered. Its bright orange color and tall habit are much needed where tall plants are required. These bulbs can be grown in the border in the same manner as the Gladiolus. All the Ixias are of great beauty, with many colors and distinct markings. They bloom for weeks in midwinter. There are many garden varieties. The natural size of the flowers has been increased by selection and cross-pollination. There are about thirty species.

BABIANA.

SPARAXIS.

THE RANUNCULUS.

C. L. ALLEN.

Very few races of plants have a wider geographical range, or a greater diversity of character than the Ranunculus. The genus contains species of rare beauty and a few troublesome weeds. Some are inhabitants of swamps, and others thrive in dry, waste places. The common buttercup, *R. bulbosus*, is a weed in our marshy meadows, but it is as welcome as spring to the botanist, or the lover of early flowers. It gives so much warmth and life to the landscape that, troublesome as it is, the meadow would seem unnatural without it. The Ranunculus of gardens is *R. Asiaticus*, commonly known as the Persian Ranunculus, although it was first introduced from the Levant in 1596. With many other florists' flowers, the species has expanded to many varieties produced through the agency of cross-fertilization. One hundred years ago it was one of the most popular plants under cultivation, 800 distinct varieties being grown. It is still exceedingly popular in Europe, where it can be easily grown, a bed keeping in bloom for fully two months. The flowers are of various shades, and with an intensity of color, only to be found in the poppy. There is no class of plants more free-flowering. A good, strong tuber will throw up as many as thirty flowers. Its name is from *rana*, a frog, because the plants usually inhabit the same places. For that reason, beautiful as the flower is, it is not well suited to our climate, and can only be grown under artificial conditions that render its cultivation here impracticable. The Ranunculus is one of the many plants of remarkable beauty in their own homes, but not adapted to other climates. Drouth, poverty of soil, rare atmosphere, and fierce sunshine, are fatal to its development. It is, moreover, easily injured by frost. Very satisfactory results, however, can be obtained by planting the bulbs in a cold frame, protected by a liberal mulching of leaves to exclude the frost. In early spring remove the mulch, but keep the sash on, as cold winds are fatal; on the other hand, they will not endure intense sunshine, so that great care is required in shading and ventilating to imitate well the cool, moist climate of Europe.

BUNCH OF RANUNCULUS.

DESIRABLE WINTER-BLOOMING PLANTS.

EBEN E. REXFORD.

The list of plants suitable for cultivation in the sitting-room, which can be depended on for bloom during the winter season, is not a long one. Those briefly described below can be recommended to the amateur:

Achania malvaviscus. A plant having large, bright green foliage, with crimson flowers. The contrast between flowers and foliage is very pleasing. It is almost always in bloom. It grows to be quite large, and can be trained as a tree or shrub. It is easily grown, and is seldom attacked by any insect.

Abutilons in variety. These plants are excellent for house culture, being strong and vigorous, not over particular about heat or dust, constant and profuse bloomers and very pretty. The flowers are bell-shaped and pendulous. The best varieties are Boule de Neige, pure white; Rose Perfection, bright rose color; Arthur Belsham, bright red; Golden Fleece, sulphur yellow, and Crusader, scarlet. Eclipse is a variety having leaves beautifully variegated with green and yellow. It is of semi-trailing habit, and makes a pretty plant for a bracket.

Primula obconica. One of the best winter flowering plants. Really an ever-bloomer. The flowers are white, shaded with lilac. They are small, and borne in clusters which are lifted well above the foliage. Plant in a light soil, and be sure to water well, as the roots are numerous and drink up a great deal of moisture. Primulas are very pretty for bouquets.

Begonia rubra. An old and well-known species of the begonia genus, but one of the best window plants we have. Always in bloom. Foliage a rich, shining green. Flowers scarlet, borne in large, branching, drooping panicles. Very showy, and always satisfactory.

Calla aethiopica, or Lily of the Nile. Not a lily in any sense of the word, though generally called Calla lily. It is one of the most desirable of window plants, because of the great beauty of its foliage, as well as flowers. The leaves are large, and have a tropical effect. Flowers, or what is generally supposed to be the flower, white, large, and somewhat trumpet-shaped. What most persons consider the flower is really a sheath which enfolds a spadix on which the real flowers are borne. One fine, large plant of Calla gives dignity to any collection, whether in or out of bloom.

Impatiens sultani. One of the most cheerful plants I know of. Always in bloom. Flowers bright crimson-magenta, produced in great profusion. A delightful plant. Give a light, leaf-mold soil, and keep the earth very moist. Shower the plant all over, daily, to keep the red spider from working on the underside of the leaves.

Fuchsia speciosa. The only variety of fuchsia worth cultivating for winter flowering. Almost an ever-bloomer. Flowers of medium size, borne in long, pendulous bunches. Sepals rosy white; corolla salmon red; single. This plant is a strong and vigorous grower, and often reaches a height of six or eight feet. Foliage large, and very pleasing. A most charming winter flower, of the easiest cultivation. Use a soil of leaf-mold with some sand mixed in; drain the pots well, and water freely. Shower daily. An old plant will require a ten or twelve inch pot. It can be cut back in summer and kept dormant for a period, and then started into growth in fall to be ready for another season of winter-flowering.

FLOWERING BULBS FOR THE WINDOW GARDEN.

Hyacinth, tulip, crocus, freesia, and other bulbs, can be easily prepared in the fall for blooming through the winter. Failure is hardly possible with even the smallest amount of careful attention being given to their wants. Get strong bulbs, and of the hyacinths place one in a four-inch pot, of tulips put three in the same sized pot, while of crocus and freesia such a pot will hold, at least, a half dozen. Use rich soil, and in potting set the hyacinth bulbs only about half their depth in the soil. If desired, glasses may be used for hyacinths; they can be bought with the bulbs and filled with enough clear water that the base of the bulb just touches the surface. Potted bulbs, to grow in earth, should be set in a dark, cool place, after giving them a good watering. Here they should stay for about six weeks, then a few may be placed in light and warmth. Much heat, however, is not needed. As the buds are swelling, several waterings with rather weak manure water will result in more perfect flowers. Bring them out at intervals of several weeks and flowers may be had nearly all the time during the winter. Where bulbs are grown in water, however, instead of preparing them all at the same time, only a few should be started at once, others being started at intervals of a week. The bulbs may be placed in pots of sand, and when wanted the sand can be washed from the roots, and the bulbs placed in glasses. While growing in the glasses the water should be changed several times.

HERBACEOUS PLANTS.

Those who intend to make a collection of hardy herbaceous plants, as all should do who wish to have an inexpensive and attractive flower garden, should begin now. If we wait until spring, many valuable species will already be in bloom, and cannot be moved with any certainty of success. The best time in the whole year for planting is October and November, although, if the weather remains warm, at least, if the ground does not freeze hard, many kinds may be planted in December. But it is decidedly best to commence the work as early as possible. All herbaceous plants should be removed, and separated, if need be, at the commencement of their season's rest, rather than at the commencement of a season's growth. But few hardy plants will notice the change when taken up in autumn, while but few will flower well if removed in spring. Nearly all hardy herbaceous plants make their preparation for the coming season's flowers when at rest, and if disturbed after that it will be at the expense of a season's flowers. If a new bed is to be established, it is better to get plants grown in pots from seeds. These can be planted at any time, either in spring or autumn. But where propagation is affected by division, autumn is far preferable. Peonies divided and replanted in October will usually flower freely the coming season, while, if the work is deferred until spring they are frequently so checked that they will not flower for several years after. Dielytra, and many other species, coming into flower so quickly after the frost has disappeared from the ground, are injured by removal in spring.

The herbaceous border, whether long established or newly-planted, should not be neglected. Although the plants are hardy, so far as life is concerned, if they are expected to develop the full measure of their beauty, in our changeable climate, they have to be protected, though but little protection will be necessary. A covering to the depth of two or three inches of newly-fallen leaves, or about the same depth of coarse litter is all that is necessary to make such a difference in the coming season's flowers, that they would scarcely be recognized as the same species unprotected.

KEEPING FROST OUT OF CELLARS.

T. PAYSON, UTAH.

During the coldest nights of winter I keep a thermometer in my cellar, and when there is a probability of the temperature falling below the freezing point I keep out the frost by placing a lighted central draft lamp on the cellar floor. The flame is turned low, so that but little oil is consumed, and, if necessary, it is raised toward morning. I have not banked up the house on the approach of winter since trying this expedient, and have kept out the frost with much less expense than was required in banking up the foundation walls with earth and straw. The heat thrown off by a central draft lamp is very great, in proportion to the size of the flame, and could be utilized to protect house plants in the windows and those stored for winter in cellar or cold-pit. A lamp of this pattern can also be attached to a window box, so as to give bottom heat in starting early vegetables, flower seeds and cuttings, thus giving the amateur many of the conveniences of a greenhouse or hotbed.

Why Plowing is Harder Work Than Drawing a Wagon.—While the work done in plowing may not be greater, theoretically, than drawing a wagon by the same exertion of force, yet the plowing is really harder and expends more actual force, because of the dead weight moved. It is easier for a man to carry a load of any weight, twice as quickly, by spurts, with rests between, than in any given time with a constant movement. Let a man carry a bag of corn for five minutes, and then rest five minutes, and then repeat, and he will make better time than another man of equal strength who has twice the time allowed him. Equally, a horse may travel fifty miles every second day and last longer than he would if traveling twenty-five miles every day. And this is what makes the difference between plowing and drawing a wagon. Every little inequality in the ground and every spurt of the draft, is a rest for the horse, by which he is refreshed. But drawing a plow is a dead weight without any rest. The horses walk on yielding mellow ground.

THE MERCER CHERRY.

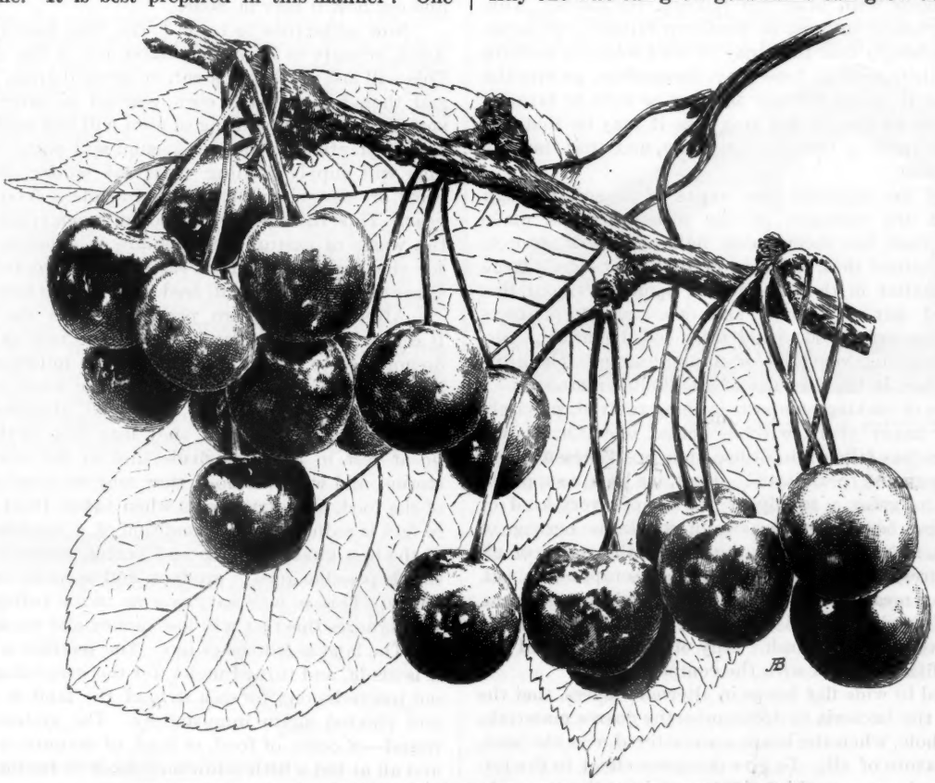
A Heart cherry, larger than the black Tartarian, and finer flavored, is the claim made for the Mercer cherry, shown in the engraving, reduced one-third from specimens sent us by Joseph H. Black, Son & Co., the introducer of this new variety. It was found growing among some seedling Mazzard cherries in the house yard of an old farm. The former owner of the farm was born on the old homestead and cannot r emember a sinle year when this cherry tree did not bear. It is a sure cropper and a splendid shipper, and brings the highest price in the market. The Mercer cherry is entirely different from the present varieties of Heart cherries, being early and of a very dark red color. In growth and hardiness it is like the Mazzard, or common Black Heart. It is a profuse bearer, the one tree yielding over thirty baskets of fruit. Neither tree nor fruit has ever been diseased or wormy, and the tree is certainly very long-lived. The twigs continue to grow late in the season, and the leaves remain a rich dark green into the autumn.

DESTROYING MEALY BUGS AND RED SPIDERS.

E. E. REXFORD.

There is nothing so effective in fighting the mealy bug as an emulsion of kerosene. It is best prepared in this manner: One part slightly sour milk to two parts kerosene. It is important that the milk be only a trifle sour. If sour enough to be thick, it is very difficult to secure a union between the two liquids. If you are preparing only a small amount, say half a teacupful of milk to a teacupful of oil, you can use an egg-beater to churn these two elements of the emulsion. If in larger quantities, a brass syringe, such as most greenhouse men have, is the best thing to use. The point to be aimed at is rapid agitation, and stirring with a spoon, or stick, fails to bring about the desired result. The more rapidly the milk and oil are agitated the better the result to be secured. The two should combine and form a shining white butter. To one part of the kerosene emulsion use about twenty parts of water. Mix it as thoroughly as possible with the water, and apply with a syringe, taking great care to reach every part of the plant, and especially the axil of each leaf, for this pest hides away as if expecting danger. One application may not be enough. Wait three or four days, and give another one. This emulsion, used in the proportions named, does not injure delicate plants, and it does its work well. It is also effective against scale, a pest often found on oleanders, lemons, oranges, ivies, and other thick-leaved plants. In fighting this enemy, apply the emulsion with a brush stiff enough to forcibly remove the insects which are on the leaves. As the mealy-bug establishes itself in cracks and crevices of boards, and on cloth, it is a good plan to syringe the walls of the greenhouse, else you fail to rout it in its most effective strongholds. Neglect these places and it soon sallies out and makes a raid on your plants again. The red spider is a tiny thing, but he is nevertheless a most formidable enemy to many plants. He likes a warm, dry atmosphere, such as prevails in most living-rooms. So small is he that his presence is seldom suspected until the leaves of the plants are found turning yellow. Then, if you examine the underside of them, you find some little red specks, and tiny webs. The only remedy needed is water. You must see, however, that it reaches every part of the plant to the underside of the leaves, for there is where he lurks most.

In most greenhouses the red spider seldom does damage because there it is easy to keep the air moist all the time. A greenhouse moisture cannot be secured in the living-room, but it is easy to keep the air a great deal moister than we generally find it, if vessels of water are kept evaporating on the stoves or registers, and the plants are well showered daily. If heroic treatment is necessary, heat water to 120° and dip the infected plant, letting the plant remain under water while you count ten. Repeat in a day or two.



BEARING BRANCH OF THE MERCER CHERRY.

FLOWERING BEGONIAS.

MARY FROST, CANADA.

A rich sandy soil suits flowering begonias best. The tuberous varieties have larger flowers, but the old flowering kinds are much grown and are useful for variety. This genus presents wonderful foliage, colors and forms. Many of the most valuable and useful house and garden plants are found among the many and widely differing varieties. Their culture is very simple. Any one who can grow geraniums can grow the begonias. If they were bedded out during the summer they should be potted and brought in before frost comes. If they have been in pots all summer, repot them in fresh soil, cut them back well, and give them a good supply of water, and they will soon start into bloom. *Begonia rubra* is probably the most desirable, but there are others nearly as valuable. *B. argentea, metallica, Saundersoni* and a host of others, are free flowering, and the foliage of some of them is very fine. When these begonias are growing the earth in the pots should not be allowed to get dry, for if the soil dries out they will never look as well again. With good drainage in the bottom of the pots, you cannot give them too much water. When they are blooming freely they should have some fertilizer. Guano is good, so is commercial complete manure. In the absence of these, stable manure will do. Put this in water until it is the color of strong tea, and wet the soil with this once a week. Another point in favor of these begonias is that they are so easy to care for, and insects never trouble them.

Care of Work Horses at Noon.—When work horses are brought in at noontime, the harness should be removed, the sweat wiped off and the brush and curry comb freely used. The shoulders should be washed if they are sweaty or sore. Before starting work the sore shoulders may be softened with castor oil. Do not water the horses while warm, nor feed them grain. Both at noon and at night the horses should be watered previous to feeding grain. The stomach will then be in better condition for the assimilation of solid food. If obliged to give a short hour at noon give a larger ration of grain, or what is still better cut the hay into half inch lengths and add the usual quantity of ground feed, sprinkled with water, and thoroughly mix. This can be eaten rapidly, and will digest more readily than when fed separately in the dry, dusty state.

COMPOSTS AND FERTILIZERS.

HENRY STEWART.

Recent discoveries have completely disturbed the previous views held in regard to the use of commercial fertilizers as the sole dependence for cultivating crops, and the value of composts as an aid to them. Long practice has confirmed the value of the home-made supply of manure, augmented and made more effective by the addition of the many kinds of refuse matter that are available for the purpose, and, as with other things, so it has been found that this old-time practice has a value that has not been fully understood. In growing all kinds of crops, the compost heap is a valuable aid, under these conditions in which the materials are cheap.

A question is proposed, by a subscriber in South Carolina who cultivates fifty acres of asparagus, that is of wide and unusual interest. A large supply of fertilizer is desired. Abundance of materials for making composts are easily procured and sixty head of cattle can be fed for the small sum of $400 for the whole year. These cattle, being penned at night, may be made to supply a large quantity of manure. Will it be more profitable to continue to keep these cattle, for the sole purpose of manure makers, or to dispose of them and use only commercial fertilizers, and compost marsh grass and marsh muck with lime and mineral fertilizers? This question is of the greatest interest to Southern farmers, for cattle can be fed there so cheaply that they may be used solely as manure makers, and when their work is done may, themselves, go into the compost heap. But it is not without interest as well to farmers everywhere, for if the cattle are fed at a loss, it may be that this loss is less than the value of the manure made, and that thus the manure returns a profit.

The discovery of the organism that exists in the soil, through whose intervention the nitrogen of the atmosphere is made available for plant food, has thrown new light upon this subject, for it has been ascertained that, for its growth, it must have a large supply of organic matter in the soil to feed upon. Without this food it is reproduced only very slowly, and, of course, its products must be in proportion to its food. And this needed matter is furnished by any decomposing vegetable or animal matter. The nitrifying germs thrive best in the presence of an alkaline matter.

The old practice of making composts is being revived, precisely as it was used for many years, without actual scientific knowledge. This practice has fallen into disuse, in a great measure, but we now see that it must be resuscitated. First, we have a supply of moisture. Second, as great a supply as possible of every kind of organic matters as can be procured, as swamp muck, the herbage of marshes, sea weeds, marsh mud from the shores, the refuse of all sorts of manufactures, of slaughter houses, fish scrap, night soil, guano, cotton seed or meal, and to get an intimate mixture of them. Third, a supply of fresh lime, of limestone, or shells, burned in heaps with refuse wood, or of potash. Any of the commercial fertilizers may be profitably mixed with the compost.

These are placed in wide flat heaps in alternate layers, that the lime may act with the bacteria to decompose the coarse materials, and make of the whole, when the heaps are scattered over the land, a homogeneous mixture of all. To give complete effect to the fermenting changes undergone in this mixture, at least three months will be required. There is not much danger of overheating in such heaps when the manure does not exceed one-fourth, or less, of the mass. The writer has built many such heaps in this way during the winters, for some years past, and there has been no more heat engendered than would keep the fermentation going; and in April the heaps, when shoveled down into the wagons for spreading, or into the manure spreader, were a dark, rich mass, much like solid old manure. The odor of it was precisely that of ordinary manure, showing that by this means the matters combined were as really changed into manure as if digested in the system of an animal. And this is exactly the result, the matter being decomposed by the action of bacteria growing with the proper heat and moisture. One thing is to be avoided. This is overheating for want of moisture. This destroys the germs, and stops the desired effect. If necessary, water is to be applied, to retain a moderate moisture.

It is simply a question of the cost of feeding the cattle, as machines for making fertilizers. The writer has purchased cattle in the fall, at two cents a pound, fed them during the winter at a cost of not more than $10 a head, and sold them the next summer off the woods' pasture at the same price per pound. There was no loss, the clover and grass and cornstalks were worked into manure, and this went on to the land at a much less cost than its equivalent in fertilizers. And, as it is ascertained now, the effect of this manure on the soil was fully as beneficial as a much larger value of mineral fertilizers, counting its effect. It thus becomes one of those questions of counting up the cost, which differs with circumstances and locality. But experience has abundantly proved to the writer that where cattle may be fed for $10 the year, and can be bought for two cents a pound live weight, it will pay well to use them as machines for making manure.

HOW TO BEGIN SOILING.

S. MACON.

As the present tendency of commerce is to cheapen products, the farmer must conform to it, or he cannot keep up with civilization. Under many circumstances soiling reduces the cost of keeping cows very materially. To pasture a cow requires five average acres of land for the summer, and one acre for the winter's hay, while an acre and a half of rich land will furnish feed for the whole year. The experiments of J. W. Sanborn at the Utah station seem to show that pasturing is wasteful, that soiling gets more from the ground, but that where forage can be economically dried, the dried food will nourish stock just as well as the green. This may be taken as a possibility, therefore the only thing that remains is to find out how it may be done.

Now is the time to begin. The first feeding must be ready in April, or early in May, and winter rye is the most available crop. This will last until the clover, or orchard grass, is ready for cutting, and then follows early corn, planted as early as possible in the spring. The first planting of corn will last until August, when the second planting on the rye ground will come in. Repeated plantings will supply feeding until the winter, when silage, or field beets or mangels, will furnish succulent food for the rest of the year. Thus there is a succession of green crops the whole year and the waste of pasture and manure is avoided. The acre of land for the hay will produce easily twelve to twenty tons of either silage or roots, which will feed three or four cows during the winter.

After the crops are planned, comes the manner of feeding. It is a part of what may be called the new agriculture, that cows do not need to waste their food in the muscular exertion incident to pasturing or to fighting in a yard the whole of a winter. A comfortable stable is provided, in which, sheltered from tormenting flies and enervating heat, they may feed on the fresh fodder, and lie at rest in the cool shade, and in the winter, protected from storms, and wasteful cold, they may be employed in making milk of the food, as nutritious as when taken from the field. The cow in fact is reduced to the condition of a machine for changing food of the best kind into milk and butter, without waste. Everything that is possible goes to product, and as little as possible to maintenance. This is necessary now as never before, and the dairyman who ignores this fact will lose money and waste time.

The land is fed better too. The manure is taken to the field as it is made, and turned under for the crops that are growing, without intermission; for as a strip of the land is cleared it is plowed and planted again immediately. The system is an economy all round—of cows, of food, of land, of manure, of labor, and of time; and all at but a little additional labor in feeding, which in practice has been found to cost not more than two cents per cow per day. This is necessary for the cutting and carrying of feed to the cows, but is little more, really, than the common driving of the cows back and forth to pasture. The rye may be sown in October and November, and as one square rod per day feeds a cow, it is easy to figure up how much should be sown to supply the herd.

THE BIRD'S FOOT VIOLET.

In our search for spring flowering plants the Bird's Foot Violet (*Viola pedata*), a native of our dry woods, should not be overlooked, as it bears cultivation very well in our gardens. In fact good or liberal culture increases the size of the flowers, as well as productiveness; although nothing could be more prolific of flowers than this, in its native habitat. It is a plant always found growing in masses, and, for at least two weeks, the flowers cover the earth like a carpet, and the color, deep lavender, with a darker shade on the lower divisions, makes it a most desirable object. In the gardens the flowers are one and a half inches in diameter, with more substance than when grown without cultivation. They produce corms nearly as large as filberts which renders their cultivation very easy, as they can be removed at any time if the corms do not dry. For an edging there is nothing more desirable than this violet.

COLD STORAGE HOUSES FOR FRUIT.

ELMER E. SUMMEY.

A very successful cold storage house for fruit is used by G. W. Cline of Ontario. The accompanying illustrations from his sketches convey a fair idea of the general appearance and construction of the building, which is thirty-six feet long and twenty-four feet

FIG. 1. PERSPECTIVE VIEW OF FRUIT HOUSE.

wide, and is built in the side of a slight hill. [Fig. 1]. The basement wall is of stone eighteen inches thick, one side being sunk in the ground two feet, the other side next the hill going in six feet. The total height of the stone walls is eight feet, the floor of the basement is made of eight inches of clean coarse gravel with one coat of water lime cement grouted in, with another coat on top, made smooth, thus making a dry solid floor on which to roll barrels.

The basement is divided into two equal apartments; the entrance is from the front and north side, the floor being almost level with the outside surface. Both the doors and windows are double, the latter being provided with screens to keep out flies and bees, when open for ventilation. This room is ceiled with inch boards, on top of which, between the joists, is placed an inch and one-half of mortar.

The upper part of the building is fourteen feet to the eaves, the middle room being eight feet in the clear. The studding is five inches wide, and on the outside are two thicknesses of tar paper, over which are put inch boards up and down, battens being put over the cracks. On the inside of the studding are two layers of tar paper, then a two inch wide studding, on which the paper is

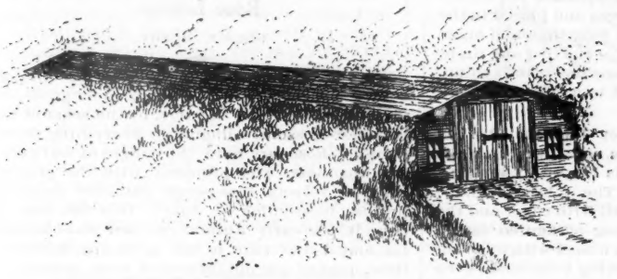


FIG. 2. PERSPECTIVE VIEW OF FRUIT CELLAR.

again placed double, over which comes matched inch lumber, making two dead-air spaces to insure against the changes of outside temperature affecting that on the inside.

The ceiling of this room is formed by putting one thickness of paper on the joists, covered with matched lumber. The floor is of matched two-inch plank, thus making dead-air spaces between the cellars and the upper room, and also rendering it impervious to rats and mice [Fig. 4]. This floor is occupied by an office and stairway in one end, and these leave a clear floor-space of twenty-four by twenty-four feet, for storing and packing purposes. Shelves, thirty-two inches wide, are placed all around the wall of this room, and are capable of holding about seven tons of grapes or other fruits, leaving the center for such as are in barrels.

From the east side of this room a door opens into the raised portion of the shed. Through this door the fruit can be unloaded from the wagon without any lifting. This shed runs the whole length of the building and is sixteen feet wide, with a ground floor, and is large enough to allow of packing being done, as well as being able to accommodate several loads of fruit over night or through a shower. The top story is eight feet high in the center, the floor being inch stuff matched, laid on tar paper; the sides and ceiling are lathed and plastered. It makes a cool room, pleasant to work in, or good to store grapes and other fruit in baskets, as the veranda on the west side has a flat roof, with a door opening on it, which renders it very convenient for loading or unloading, as the top of the wagon is nearly on the level with the roof. The veranda is six feet wide on the two sides.

A galvanized iron ventilating tube, two feet in diameter runs from the fruit to above the roof, to carry off the heated air. Other ventilating doors should be close to the floor, and be kept open at night, thus making a cool draft all night, through the fruit room. The doors are to be closed air-tight early in the morning; the room above can be ventilated through the same tube or shaft all day, drawing off all the warm air that is heated through the roof.

A fruit cellar, that experience has proved excellent for the purpose of storing fruit and vegetables [Fig. 2], is located along a slight hill, which was dug out four feet so as to form one side of the house, as shown in the cross section [Fig. 3]. The other side is a stone wall, one foot thick and four feet in height, the ground from the excavation being thrown against it from the outside, the rear end being like this side. The front end, as well as the doors, which open inward, and are large enough to admit one-horse loads, are made of a double thickness of inch boards, having a space of six inches filled with sawdust. The sides and rear are lined with inch lumber; and boards, a foot in width, are placed on edge lengthwise on the floor for paths between the ample storage spaces.

The roof combines lightness, strength and warmth, and is made of inch boards sawed to a length that will form a span, the

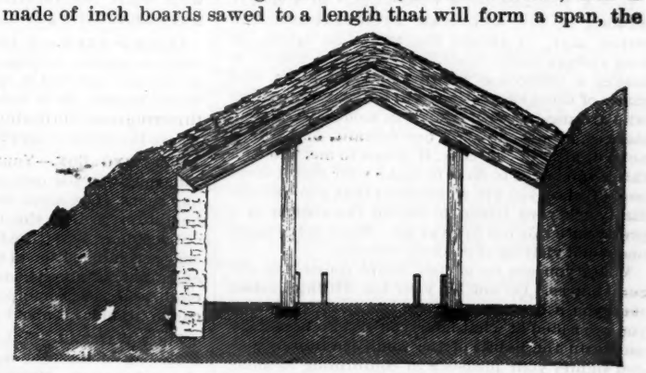


FIG. 3. CROSS SECTION OF FRUIT CELLAR.

peak of which is three feet higher than the top of the side walls, or seven feet from the ground floor, thus allowing a horse or man to go in readily. After the first board is down, a layer of straw is put on it, thick enough so that when the second board is pressed down firmly, the straw will be a foot deep. On the second board a similar layer of straw is placed, which then is tightly covered with matched boards. On the top, boards two layers of tarred paper are laid, and each crack is well battened, so no water can get through. The outer edges of the thick roof are treated as shown in the cross-section. Wherever the soil is not sufficiently porous to allow of the free escape of water from the hillside of the roof, a tile, or other drain, must be provided. At equal distances from the center to the sides an upright support, consisting of a 2x4 scantling, of the proper length, is set on a brick, while at the top an inch strip four inches wide is run the entire length of the roof, which, in this case, is 100 feet. In the front end two windows are placed, and one large window in the rear, provision being made to allow the use of double sash and shutters during the coldest weather. The estimated cost of this house was about $100, no skilled labor being required, and rough lumber being used except for the last roof boards. The storage capacity of such a building is ample. Nearly 50,000 celery plants have been accommodated, and it holds hundreds of bushels of vegetables, apples and other fruits through the fall and winter.

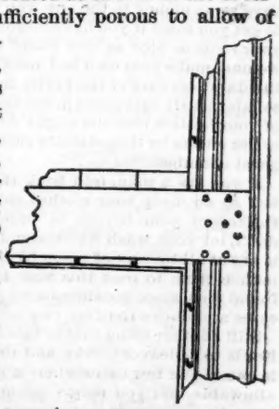


FIG. 4. SECTION OF FLOOR AND CEILING.

English and Italian Rye Grasses.—The Italian rye grass has a beard or awn on each seed, while the English rye grass has none. The latter is the hardier, but both have become wild as far north as the Great Lakes, and both thrive in Scotland and Canada.

HOUSEHOLD

For Those Who Visit.

ALICE CHITTENDEN.

People who live in the country are proverbially hospitable. The comparative isolation of their lives prompts them to eagerly "welcome the coming guest," and if they sometimes feel that they would like to "speed the parting guest," it is often the fault of the latter. When I was a child and lived in the country, I think we were never without visitors, during the fruit season at least. I used to wonder what Mother meant, when, after the unusually long stay of some mere acquaintance, I heard her say, "Some people would hang themselves if you gave them enough rope." As that person seldom made a second visit, in after years I comprehended my mother's remark.

In "A Housekeeper's Complaint," in a recent number of the AMERICAN AGRICULTURIST, the writer says, "I should like to see an article on how visitors ought to act." Hence these hints. It makes a difference where you are visiting, and many of these suggestions will only apply to those who are staying with friends in moderate circumstances, who keep only one servant, or perhaps none at all. In this case, it seems to me, the first thing you ought to do is to make your stay a short one. Unless you are so situated that you can cordially ask your friend to return the visit, it is a pretty safe rule not to go at all. There is too much one-sided visiting of country friends.

When you are on a visit, adapt yourself to circumstances. Do not let your too willing hostess send you a breakfast in bed. If possible, before you are asked at what hour you like to breakfast, ascertain the habits of the family in this respect and signify your pleasure in conforming to them. Remember that in the morning your friend is almost certain to have household matters which require her attention, and see that you leave her free to attend to them. Relieve her of the burden of providing entertainment for you by showing her that you are capable of having a good time by yourself. If she sees you reading or writing in a shady corner of the orchard or lawn she will feel all the satisfaction of a generous hostess who likes to know that her guest is enjoying herself. Speaking of writing reminds me that it will be well to take your own stationery, so that you need not borrow hers. Don't ask her if she has a stamp. Give some money to the one who mails the letters to get you some if you have forgotten them. Keep your room as nice as you found it. If you are a woman, make your own bed, not forgetting to take the daintiest care of the pretty bureau belongings so laboriously fashioned in the few spare moments of your hostess that she might do the more honor to her guests by thus daintily furnishing forth her guest chamber.

If you are a man, fold back the covers of your bed to air, keep your clothes tidily hung up and the top of your bureau in order, and don't, oh don't, let your wash water stand in the bowl. It is not at all by way of a sop to the sterner sex to induce them to read this that I say I have ever found men more considerate of a hostess and her cares and duties than my own sex.

Still another thing that is incumbent on the visitor is to endeavor to like and praise the food. It is one of the few cases where a little hypocrisy is allowable and you may "assume a virtue if you have it not," for the chances are that if you do not like it the fault lies with your peculiar tastes. Those who have "notions" about their food had better stay at home where they can be humored. Children are very apt to be finical and troublesome in this respect, and mothers will do well to bring them up with a wide range of "likes" in the matter of eating.

There is no particular virtue in doing any of the things that I have enumerated. They are simple matters of courtesy that one's own heart should prompt one to do without any advice on the subject, and yet I know, from criticism that I have often heard expressed, that they are more honored in the breech than in the observance. Somehow I have been very fortunate in my friends, seldom having had a guest in whose visit I did not take the greatest delight and few whom I could not ask to repeat the visit, for unless I wish a repetition I never ask it.

There is at this moment a gentle girl visiting a neighbor of mine at the seashore whom I am sure will be asked to come again. Evidently she believes that rest is merely a change of employment, for she is never so happy as when she can assist her hostess about the house, or help with the sewing. Of course when one invites a visitor it is not necessary that she should do any work but, if in an unobtrusive way she can lighten the cares of her hostess, I am sure she will be the happier for it.

And now I fear no reader of the AMERICAN AGRICULTURIST will ever want to visit me.

Inexpensive Gift-Making.

EMILY H. LELAND.

For those who have little leisure and little money, these suggestions may be of interest:

CRADLE COMFORT.—Two yards of twilled Turkey-red calico, filled with nice cotton, tied thickly with white zephyr wool, and finished around the edge with white feather-stitching, makes a gay and serviceable little gift for a baby friend.

TABLE SCREEN.—A two-by-three yard piece of white mosquito netting—the plaid sort—hemmed all around and tied at intervals of six inches with white zephyr, is a neat and pretty screen for throwing over the dining table, in busy households where the table is laid in advance of meals.

BLACKING BOX.—Young John may like an arrangement in his own room for shining his Sunday shoes. Get a box from the grocer of suitable height for resting the foot upon when polishing or boot shoe; leave the front side of it open for the easy accommodation of brush and blacking, and an extra pair of shoes; cover the top with black oil-cloth, and tack some pretty cretonne or furniture calico in folds all about the sides with brass tacks.

FOOT WARMER.—Make a stout little six-by-eight inch bag of linen or bedticking and fill it with clean, dry sand. Make a larger bag of eider-down flannel, fifteen inches wide and deep enough to reach to the knees, with a draw-string around the top by which it can be hung up when not in use. The sand-bag heated in the oven and placed in the larger bag will keep warm a long time and make a soft and comfortable heat for the feet and limbs of an elderly person, or for any one who is so unfortunate as to be consigned to a cold room on a zero night.

A SMOKING SET.—If farmer John is addicted to smoking—and I hope he is not—a welcome gift to him will be a pound of his favorite "fine cut" and a dozen clay pipes. The tobacco can be placed in a little ten cent pail with cover and the pail set into a gay little bag of figured sateen shirred around the top and adorned with a bow of harmonious ribbon—the shirring to be made even with the top so that the cover can be readily lifted. The pipes may stand in a pasteboard jar similarly covered, and some little fancy match safe will complete the set.

Judging by Appearances.

LUCY ELLIOT KEELER.

An old clown, the fable runs, stood beside a brook while his ass waded in to drink. To his horror he saw her devour the moon, which had a moment before sparkled there. Thinking that the world could ill spare that luminary, he killed his useful ass to release the moon. Appearances were certainly against the animal. They are often against human beings, and we, with the wisdom of the clown, accept them on the spot, and judge our acquaintances accordingly.

A few years ago a young woman from the country stood on an Albany pier waiting for the boat. She had some heavy luggage which was almost more than she could carry. "Let me help you," a large red-faced man at her elbow said with a smile. "No," replied the girl shortly, thinking that he was a pickpocket or a thief, "I will carry my own baskets." A few moments later the same man passed her, bearing in his arms a beautiful child, and beside him walked a richly dressed lady. "I have more valuable treasures than yours to care for," he spoke in a low, kind voice as he passed the girl; and then for the first time she noticed his uniform, and saw the word Captain upon his cap.

A little old man once carried a message to the telegraph office at Balmoral Castle and was greeted by the operator with the rude remark, "Put your own name to it; it is a pity your master does not know how to send a telegram. The little man wrote "John Russell," and the operator looking up, beheld to his terror the great minister himself.

A caller at the White House once saw a gentleman, evidently absorbed in thought, leave the sidewalk and cross the lawn. It was contrary to orders, and a policeman charged upon him. Seizing him by the arm he turned his captive round and saw the surprised face of the President.

Olive Thorne Miller, the biographer and friend of "our little brothers of the air," says, "If you see a bird on a fruit tree picking about the branches, do not decide offhand that he is spoiling the fruit; look closely to see if he is not instead clearing it of worms that would destroy it all. When you notice a bird in a strawberry bed, do not instantly conclude that he is after strawberries; he may not care half so much for berries as he does for insects, and very often he is engaged in ridding the plants of pests at the moment that he is scared off or shot by a careless person who does not wait to see whether he is friend or foe."

These are exceptional cases, however, which only prove the rule. The world has neither time nor inclination to look often below the surface. In these thousands of years it has learned that appearances are, after all, generally correct; that in spite of April snowstorms the crocus and the bluebird usher in the spring; and that notwithstanding the immortal instance of Mrs. Conrady, the soul makes the face. So it is with judging people by their figure, carriage, voice, the company they keep, the books they read; saying unkind things about the hoiden and the flirt and the thoughtless girl using slang; heartlessly ignoring the timid, the boastful, the familiar. We should let the rule work both ways. While heeding the old adage that appearances are deceitful, and striving ourselves to penetrate the unattractive masks that our associates often wear; we should remember that we ourselves are constantly judged by mere trifles of dress, or bearing, or action, and endeavor to be outwardly that which we wish to be inwardly.

Rose Leaves.

ELLA F. MOSBY.

Many good English housewives keep through winter the sweetness of their summer garden in the linen closets and drawers, by the scent of the lavender-blossoms clinging to everything stored therein. Rose-jars were the delight of our great-grandmothers, who prepared with the greatest care the velvety rose-petals gathered from the profuse blossoming of June. This can now be done in the early Autumn, for our rose-season is far longer now than in our great-grandmothers' time, most of the old-fashioned roses quickly exhausting their season of bloom.

The best—as well as the most pleasant,—time for gathering rose-leaves is early in the morning. They should be dried, not in the hot sun, but in the shade. It is not an affair of a day or two to prepare them for the jar. They must be thoroughly dried. If you add fresh petals every day, sprinkle salt between each successive layer of rose-leaves. Dry for nine or ten days after you have gathered as many as you wish. Stir or toss the petals lightly every day. At the end of the drying process, put them in a glass jar with some coarsely-broken stick cinnamon and allspice laid in the bottom, and keep them air-tight for at least six weeks before consigning them to a rose-jar.

You need not confine yourself to rose-leaves alone, a few blue violets or wall-flower-blossoms or any of your favorite flowers may be added. The most delicious of all fragrances is that which does not tell its secret all at once, but haunts you with a thousand lovely hints and suggestions of all gardens and all summer days mingled in sweetness. To one quart of the rose-petals, add two ounces of lavender flowers, one ounce each of ground cloves, cinnamon, allspice and mace, well mixed together; and one ounce of orris root, shredded and bruised. The spices, lavender flowers and orris root are not mixed indiscriminately with rose-leaves, but the first three, themselves mixed

together, are laid in alternate layers with the rose-petals. Some authorities add a quarter of a pint of good cologne, or a little lavender water, or a few drops of any perfume or the oil of any favorite flower, but I like better the natural flowers and spices without the artifical perfumes.

If the rose-jar is opened for an hour or two in a bedroom or parlor a delicious and refreshing fragrance will pervade the room, giving to each one who enters a loving greeting and welcome.

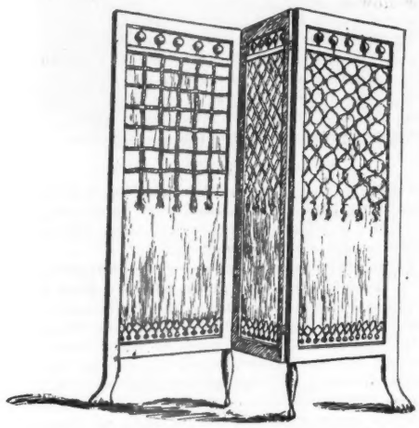


FIG. 1. TRIPLICATE SCREEN.

The spices are not only of use in preserving the pot pourri for years, but they give it that peculiarly rich and oriental fragrance, recalling to mind the rose-gardens of the dreamy poets of Persia.

The rose has even a dearer significance to the Christian's memory, for it suggests the exquisite story—a parable of communion with the Heavenly Rose—that is told of the wanderer who found a lump of clay, so fragrant that the query:

> "'What art thou?' was his quick demand,
> 'Art thou some gum from Samarcand,
> Or spikenard in this rude disguise,
> Or other costly merchandise?'
> 'Nay, if my secret I disclose,
> *I have been dwelling near the rose.*'"

Improving Dull Hours.

WEBB DONNELL.

A person who has a good kit of tools, a supply of handsome woods, and some skill in manipulating the latter with the former, is well equipped to use many a leisure hour, for the household articles that are possible of creation under his hands will afford unbounded satisfaction to himself and his home friends. I have represented in the illustrations which accompany this a number of articles that combine utility and beauty, and that, though graceful in design, are yet not difficult of construction.

The triplicate screen, Fig. 1, is formed on lines suggested by a description of something new seen in the art stores, the new feature being the rope-

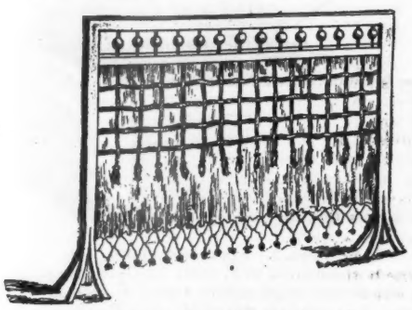


FIG. 2. FIRE SCREEN.

work lattice. The frame has holes bored in it for the insertion of small cords, woven in the three styles suggested, or woven in a similar style in all three of the frames, as the maker chooses. I do not know how others have used this rope-work, but I should prefer to make it double on each frame, the curtain then coming down between the interwoven cords, the weaving thus showing upon both sides of each curtain. A thin veneer of the same wood can be glued upon the outside of each side-piece of the frames, to conceal the insertion of the cord, which can be made of the proper size by selecting the desired shade of macremé twine, and twisting and doubling it to the desired size.

Other features need but little explanation. The fire screen, Fig. 2, is made upon the same plan, though in this or in the larger screen the design of the frame can be changed as one wishes. They are here represented perfectly plain and of simple construction, the chief ornamention being the high finish given the wood. The corner bric-a-brac stand, Fig. 3, is not necessarily difficult of construction, the part of a circle in front being sawed with a jig saw, or cut out by hand from an inch board, while the curving spindles are such reeds as are used in the manufacture of baby carriages, or, if these are not available, the spindles can be fashioned of some flexible wood, and gently bent into position. If the balls which support the top rail cannot readily be procured, the rail can be supported on square blocks, placed at proper intervals.

The upright workstand, Fig. 4, which will be appreciated by any Dorcas who may chance to be a member of the family, needs explanation only as regards the two receptacles. The one at the top is designed to be a basket of rectangular shape, set into the construction that is represented. The one below is the simple rectangular, wooden receptacle represented, with a wooden bottom. The whole will be made more attractive if the basket receives a padded lining of some material that contrasts harmoniously with the wood of which the stand may be made, while a similar lining to the lower box will prove attractive. The four sides of this workstand have the same construction, though the ornamental work is shown only upon two sides, to prevent confusion of lines.

Care of Shoes.

Every lady likes pretty shoes, but these cost more money sometimes than the slender purse can afford. Still, in shoes, as in other things the rule that "the best is the cheapest," holds good. By the best is not meant the most costly, for a very fine shoe is unsuitable for walking. For every-

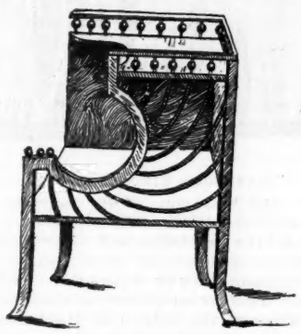


FIG. 3. BRIC-A-BRAC STAND.

day wear, get a good, heavy, and in winter, thick-soled shoe, with low flat heel. For the house have a pair of nice low shoes or slippers, and here, too, if you will study at the same time health and economy, you will get a low heel. For wear with your best gowns at church or parties, get a pair of American kid of the best make, with patent leather tips. If you are short, you may in this case indulge yourself in a pair of moderately high heels, because low heels seldom go with any but a broad, square-toed shoe, and unless you are quite free from personal vanity you will not like, on gala days, to display your pretty foot in one of these comfortable but not pretty shapes.

With proper care these three pairs of shoes should keep you nicely shod for a year. But you must, even with thick shoes, wear overshoes in bad weather. Should you by any mishap get your shoes wet, as soon as you can take them off, fill them at once with dry oats. This will quickly absorb all moisture and keep the shoes from losing shape. Do not put them near the fire, and if oats are not convenient, stuff them full of soft paper. Take out the filling when the leather is dry. If by any means leather has become hardened by water, paraffin will restore its softness You can keep the water out of your storm shoes by heating the soles a little and rubbing them with copal varnish. When dry, repeat this three times, and, unless you go over the soles, you can walk on wet ground with impunity. If shoes creak, and alas! most of them do, pour a little linseed oil in a dish and let the shoes stand in it over night; this will also aid in keeping out wet.

A Novelty in Satin and Lace.

ANNA HINRICHS.

Dear to the feminine heart are pretty fancies in satin and lace. The shimmering folds and filmy meshes form dreams of ethereal loveliness.

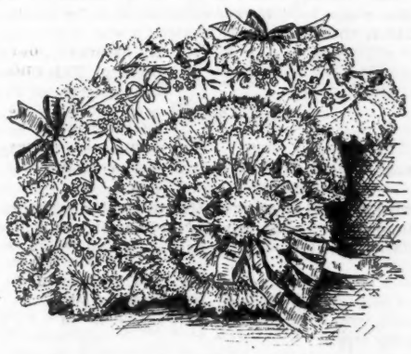
The handkerchief case pictured below is a novelty in the form of a fan, indeed, its construction is based on a couple of folding fans, pale blue or cream in color. They are firmly fastened together at the handles, and tied with bows of blue and white ribbons, thus forming a book-like receptacle for the handkerchief. Open each fan to almost its entire width, and bind the edges with ribbon. The ribs are woven or interlaced with blue and white satin ribbons. The upper fan is covered with a pad of white satin, heavily scented. A forget-me-not design in painting, or ribbon embroidery, adorns the satin. Finish the edge with a cascade of fine, very open lace, and further trim with concentric rows of the same, as indicated in the illustration.

FIG. 4. WORKSTAND.

For the pad, sheet wadding is best; six layers, cut the exact size of the fan, give the requisite thickness. What is the most satisfactory scent powder? That is dependent largely upon individual taste. Jockey club is the most lasting, but is not so delicate as the prime favorites heliotrope, violet or white rose.

Nothing is more delicious than a mere suspicion of a subtile odor—leave something for the imagination, even in perfumes. This is a splendid opportunity for individuality. Adopt some favorite odor, and never deviate from that distinctive perfume. Cologne should only be used in the capacity of a toilet water and for perfuming the water when washing the hair; for general use, it is too strong. By lining bureau drawers with flat scent cushions, and by placing small sachets between the folds of garments in trunks and boxes, a romantic fragrance, suggestive of idyllic zephyrs, is imparted to all of my lady's belongings. Powdered orris root may be liberally mixed with any scent powder, as it has the desirable property of strengthening an odor.

For drawer cushions use silkaline or imitation China silk. It may be had at 15 cents a yard, and in colors and patterns, as rich and varied as in the genuine silk. Tuft with silk floss, or by stitching and concealing the stitches with tiny bows of baby ribbon. Instead of using ribbons for the small sachets, as is commonly done, it will be found much cheaper, more practical and prettier to use satin or China silk. Buy half a yard of each



A PRETTY HANDKERCHIEF CASE.

of two colors; pink and green, purple and lavender, or other pleasing combinations. Each bag, or sachet, is made of two colors. Ornament with an embroidered monogram, turn in the open edge instead of fringing, and tie with narrow ribbons of corresponding colors, in the form of a bag.

Goose-Quill Flowers.

HANNAH RICH.

The goose-quill, with which our grandmothers were wont to pen their tender missives and prosaic communications, is now sought for by their descendants for quite another mission—that of serving as a matchless material for the imitation of Nature's floral tributes. While not now commonly kept in the shops, as in those days, quill feathers may be obtained of the stationer, of a fancier and, best of all, of a farmer or dealer in game. They are not at all expensive, and the quills of three dozen feathers will make an elaborate spray or bouquet of flowers, similar to that shown in Fig. 1.

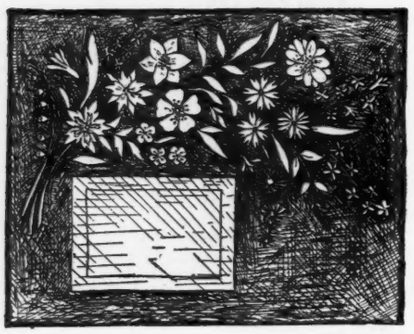


FIG. 1. A FEATHERWORK PANEL.

It is of primary importance to observe that the goose-quill, in its behavior, or misbehavior, is very like an obstinate child, and must be treated accordingly. Force is useless; naught but the gentlest of persuasion and warmth, considerable warmth, renders it submissive. Cut off the quills proper and let them soak in warm water. The upper ends, with feathers closely removed, serve as stems. They must, likewise, be first subjected to a prolonged warm water bath. All quills must be treated with an eight-hour water submersion, before they are sufficiently pliable for work. With very sharp scissors cut off the closed end of some 10 quills, to a depth of one-half an inch. The open end is cut into tiny scallops, thus forming the cup of the lily-of-the-valley, or other bell flowers, as pictured at *a* in Fig. 2. The closed end of 16 quills are cut off to a depth of one inch. Each of these is slashed into four pointed scallops, extending halfway down the entire depth, as shown at *b* in Fig. 2. After being dry, each of the four petals is turned out at right angles, as seen at *c* in Fig. 2, in imitation of the jasmine and the hyacinth. This is readily accomplished by means of small heated nippers, pinching each petal for several seconds. The iron must be very warm, but not hot. Three or four quills are cut off to a depth of one and one-half inches. Each is split and fringed, with sharp scissors, one-half its length. Then with a warm curling iron, roll the fringe outward. At this stage hold it over a heated stove or alcohol flame, until thoroughly heated; it will then readily assume a circular form. This shape is suggestive of the aster and other composite flowers, and is illustrated in Fig. 3. The remaining six quills and the unused parts of all 36, excepting the feathery part intended for stems, are now split open and rolled flat. To do this, each is first split and rolled the opposite direction, and so held in position with a cord or wire and placed in the oven, or in the sun, until thoroughly dry.

FIG. 2. QUILL FLOWERS.

FIG. 3. PARTS OF AN ASTER FLOWER.

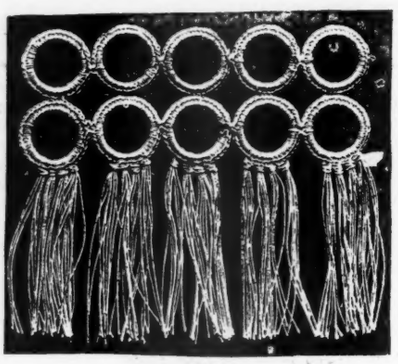
FIG. 4. PETALS AND LEAVES.

A rich ivory tint is effected by holding these pieces, prior to removing the wire, over a lighted lamp, keeping them in constant motion. After being cooled all these flat pieces are cut up into innumerable petal and leaf forms, as represented in Fig. 4. Punctures, for attaching the petals and for veining the leaves, are made as indicated, with a heated, long, darning needle. The natural curl of the petals is attained by pinching with heated nippers, or a small curling iron. The veining is most effective in embroidery or chenille silk, in light greens and browns through yellow. Pistils and stamens are of yellow, white, brown or black beads, strung on fine wire. Glass beads are the most brilliant, and the size must be adapted to be true to the flower represented.

Clusters and sprays of quill flowers are highly effective on objects of velvet of rich tint; plaques, photograph easels, calendars, and glove and handkerchief boxes. A graceful arrangement for a banner of cherry satin, stiffened with buckrum lining, and finished with bead fringe, and beaded chains and loops for hanging, is a fancy both unique and of indescribable beauty. With the above directions, this charming mode of decoration is within the reach of all. In the beginning the process may appear somewhat tedious and awkward; but with patience it requires but limited experience to render the work fascinating, and the result invariably exceeds the most exaggerated expectations.

Ring Fringe.

The fringe shown in the accompanying illustration, is one of the prettiest and easiest ways of finishing a tablespread or scarf made of felt, plush or velvet. Use brass rings of any desirable size—three-quarter inch in diameter are about right for any use—for the foundation and cover them with single crochet or buttonhole stitch, using a pretty shade of knitting silk or wool. Make two rows, sew lightly together on the wrong side, and draw in the fringe at the bottom of the lower row. When the fringe is to be used on silk or wash material, the rings make rather too heavy a foundation, in which case a crocheted chain of the desired length, joined to form a ring, may be substituted for the brass rings.



HANDSOME RING FRINGE.

The Hired Man's Point of View.

PARKER KNAPP.

I am one of that quite numerous class in the country, "the hired man." The farmer often hires a stranger from an adjoining town, of whose character he knows nothing, only to find, after a trial of a few weeks, that he must either turn him off, or put up with much that is not only inconvenient, but actually abusive. Such hired men do not deserve respect. But the honest, trusty hired man, who takes an interest in the farmer's work, and takes good care of the stock in his absence, who is temperate, whose manners and table etiquette are good, should be treated as one of the family and eat at the same table. Of course, there might be family talk that might not be best for them to hear, but should that be discussed at the table? I think that many times, where they eat by themselves, they get the idea, though perhaps false, that their board is not equal to that of the family, and become discontented.

I think there is not difference enough in wages and in home treatment between a good and a poor hired man. Where there are two hired men, perhaps one has been very steady and worked at the same place several years, and during the summer months the farmer hires another man, perhaps a foreigner, or some one who thinks he must spend three or four nights of the week at the village. Many times the trusty man must occupy the same room, and, perhaps, share the same bed. The trusty man, who is not only trying to gain an honest living, but to lead a Christian life, sometimes thinks to himself, "I wonder if, next year, it wouldn't be better to work where they don't keep more than one hired man."

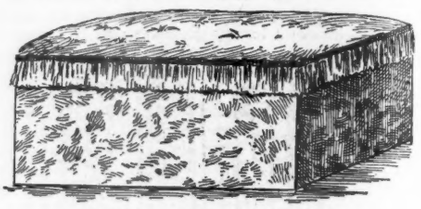


FIG. 1. WOOD BOX CLOSED.

I think if farmers would show their appreciation of a good hired man a little more, in some such ways as loaning or feeding a horse, giving a separate room or bed, there would be less changing places among the best class of hired men. Of course, the hired men should not only be neat in their manners and appearance, but should heed those little precautions that save so many steps for the housewife and others, such as sweeping the feet, pulling off the thick heavy boots and donning a pair of slippers after the day's work is done, and in many other ways avoid making dirt about the house. Combing the hair neatly, and putting on a coat and vest at the dinner table, are little matters easily attended to, and add so much to the appearance of a man, that it is a wonder they are neglected by so many.

A Cushioned Wood Box.

An open wood box, as generally made, is not a very elegant piece of furniture, being more for utility than appearance. A wood box may however, with little expense be made presentable, as well as useful, by simply cushioning the top or cover as in Fig. 1 above. The box is thirty inches long, eighteen inches high and sixteen inches wide. One end is partitioned off for the dustpan, duster and kindling wood. The box is made with a fringed cover, cushioned with some durable cloth, with a border or fringe around the edge, the sides covered with common wall paper. It is not necessary to place the box immediately behind the stove but it may be at any convenient place at the side of the room where the seat can be utilized.

A Pretty Silk Lamp Shade.

The lamp shade shown above on the opposite page, is made of yellow silk and white lace. For an ordinary sized lamp you will require two spools of knitting silk, forty half-inch rings, ten quarter inch rings, and one yard of valenciennes lace. Crochet over the small rings for the centers of the wheels, chain fourteen, turn, double twenty-two single crochet over the chain and fasten to the ring, turn, single crochet in each of twenty-two, turn, single crochet in first five of last row; chain five, single crochet in five of last row and fourth following; chain five, single crochet in nine and fourth following; chain five, single crochet in thirteenth and four following; chain five, single crochet in seventeenth and remaining stitches to ring. This forms one of the six spokes of the wheel. Join end of each spoke to second picot of preceding spoke. The ten wheels are sewed to the

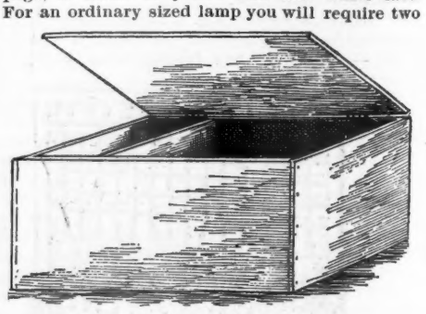


FIG. 2. WOOD BOX OPEN.

plain edge of the lace and a ring sewed to the top and bottom of each wheel. The bottom ring is for the tassel. Twenty rings are crocheted to-

PRETTY LAMP SHADE.

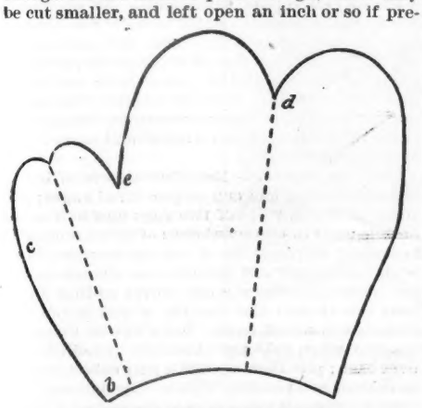
gether, fastened to the top of the rings on each wheel, and a silk cord made of the silk passes through them to draw the shade up.

Homemade Mittens.

S. E. WILCOX.

The accompanying diagram of a mitten from which a pattern of any desirable size can be made, will be a great help to the busy mother. This simple pattern consists of one piece, and fits very well. The mitten should be cut from strong cloth; woolen being preferable.

If there are no pieces in the house it is economy to buy three quarters of a yard of heavy cloth, twenty-eight inches wide. This quantity will cut two pairs. When cut, fold the mitten at the dotted lines *d* then put *c* and *e* together, and sew as far as *c*, after which sew from *d* to *b*. If any difficulty is encountered, it will be in getting the seams just right where the thumb joins the hand, but a little practice and patience will enable one to arrange them satisfactorily. After the seams have been sewed they should be opened and cross-stitched down closely. The wrist will be large enough for the hand to pass through, but it may be cut smaller, and left open an inch or so if pre-



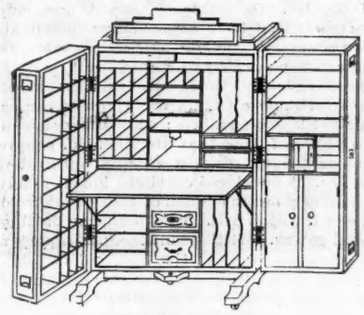
PATTERN FOR CLOTH MITTEN.

ferred. Cut a mitten a little smaller of canton flannel, make in the same way, and slip in for a lining. Fasten the two together at the top of the hand, at the thumb, and around the wrist. The inside of the thumb and hand may be faced with leather for heavy work.

A Prize Writing Desk.

HOLLISTER SAGE.

The ingenious young man on the farm is often at a loss for a pattern combining symmetry and usefulness with which to school his skill. He has made coasting sleds, picture frames, knife boxes, a cabinet, perhaps, and now the stormy days tempt him to go still further. What shall be his next attempt—shall I say victory? for by perseverance he has usually wrought out a fair model, even without the costly implements of the cabinet-maker. The desk illustrated can be made fit to grace any home, however beautiful, and this by an amateur. Few tools besides the hammer, plane, saw, a chisel, and screw-driver, are needed, although, when completed, it is quite an imposing piece of furniture. If one has a lathe, the ornamentation may be made somewhat more ornate, but it is not essential. Cabinet work, of the neatest and most elegant design and workmanship, is often, indeed, the plainest. The rudiments of this desk are three boxes. The first, or body of the desk, is 51 inches high, 38 inches wide and nine inches deep. The other two are seven inches deep, of the same height, and each one-half the width of the first, so that when hinged to it they close together tightly, forming a perfect face to the desk. The initiated will quickly see that a large amount of choice and expensive lumber is not needed, although the appearance of the article will be much richer if the drawers, pigeonholes and other compartments be made of the same lumber as the exterior, or, at least, those portions that are exposed to view. For this work, nothing is superior to oak, cherry or black walnut, using veneer of the same, one-eighth and three-sixteenth of an inch thick within. The back and bottom of the body of the piece may be formed of deal, or pine, also the bottoms of the wings. Especial pains should be exercised to firmly brace and strengthen every part as it is made, that it may never need repairing. Three pairs of loose-butt, bronze hinges should support the wings so they will not drag on the frame, while swinging open or closed. This frame—or the legs properly—is three inches high, and is held one inch from the



A HANDY DESK.

carpet by wood casters. The body of the desk, it is needless to say, is fastened securely to this frame, which is heavy and square, next the wall.

The interior arrangement of the upper part of the desk is set back one and one-half inches, allowing room for the writing table to fold up when the desk is closed. The wings come together over a slight, but strong, projection in the frame under the large, lower drawer, and into this projection the bolt of the lock is shot when fastening the desk. For a final finish to the wood, varnish is not desirable. Hard and persistent rubbing, with woolen cloth dipped occasionally in French wood filling, will impart a richer appearance and show scratches less. The process is more difficult and requires more time, but is also much more satisfactory. Such a desk will keep out dust and give abundant room for a large business, including extensive correspondence and many documents. For home use, a portion of it could be devoted to books or a cabinet, if preferred, a glass front being added to the upper part of the front. Instead of the ornaments at the top, a book rest could be made there for reference books commonly in use.

How to Dry Rubber Boots.

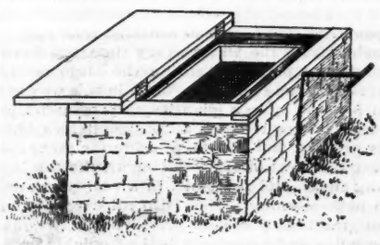
WILLARD F. HALLOCK.

Rubber boots which have become wet inside, either from exposure or perspiration are dangerous to wear until dried out, and this is often a difficult task; many wear cork soles which can be taken out and dried, others fill their boots with hot oats at night, and others shake hot gravel in them to dry them out, but all these plans are only partly successful.

The illustration presents another plan which has the merit of being quickly accomplished effective and new. A lamp is set on the floor, the boot is tied to the back of a chair, low enough so that the chimney extends well up into the boot leg, the lamp is lighted and turned up. The hot air goes just where it is needed and dries the boots.

Combined Ash Bin and Sifter.

Many mysterious fires have been traced directly to the careless leaving-of ashes containing live coals near some inflammable material. It is a com-



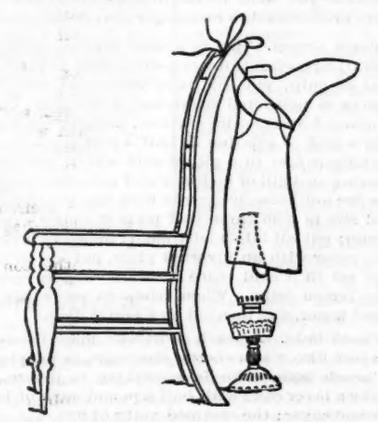
COMBINED ASH BIN AND SIFTER.

mon practice to set pails and other vessels containing ashes and live coals directly on the floor of some out-building. It is certainly very foolish to run all this risk when, for a few dollars, a good and safe receptacle for the ashes can be easily constructed. The engraving from a sketch by L. D. Snook shows a simple form, three feet wide, four feet long, two and a half feet above ground, and one foot below ground. It is made from brick laid in single tier with water lime. Where coal is used, there is great economy in sifting the ashes. Two iron or wooden bars can be placed cross-wise six inches below the top. Upon these rests a common ash riddle with handle projecting in front. By throwing the ashes on the sifter and closing the hinged cover, the coal is separated from the ashes without a cloud of dust. The handle is simply hooked to the sifter and unfastened when the sifter is emptied. Wood ashes need not be sifted, but may be safely thrown into the bin while hot. A cement floor will keep the ashes dry. Unleached wood ashes are an excellent fertilizer.

Peaches for Present and Future.

ALICE CHITTENDEN.

If there is any branch of housework shorn of its dry husks of sameness and petty details, and so filled to the brim with poesy, that even the heat of the stove over which you perform your incantations cannot dampen your ardor, it is the preserving of fruit. Waste no pity on the woman with two or three baskets of fine peaches to do up. It is an event dear to the heart of every right-minded



EFFECTIVE WAY OF DRYING RUBBER BOOTS.

housewife. Where can she find a picture half so pretty as her long rows of jars and glasses filled to the brim with amber or rose colored fruit floating in golden or rose-tinted nectar? Is she not as proud, and justly so, as artist or author when friends praise her handiwork?

Preserved Peaches. The best mode is the simplest. Use only the finest fruit for your preserves, save the inferior specimens for marmalade or peach butter. Large, juicy, ripe freestone peaches make the handsomest and finest flavored pre-

serves, but old-time housewife, wives with pride in the variety of their preserve closet, never failed to put up at least one basket of Morris Whites, which also gives a very handsome, light-colored sweetmeat. Use a small, sharp, bright and thoroughly-clean knife, and pare closely. I very much dislike to touch with steel any acid fruit, but if you halve and drop the fruit in cold water at once, no taste of the steel will remain. As soon as you have about a pound, weigh out. Previously weigh a pound of sugar and transfer it to a bowl that it will just fill evenly so that you can tell the exact pound by measurement. This will save much trouble. Have ready a large earthen bowl; lay in half your pound of peaches and sprinkle with half a pound of sugar, and so continue removing the peaches from the water every time you have a pound, and placing them in the large bowl in layers with the sugar. Continue in this way until you have as large a quantity as you intend preserving, having rejected all broken halves during this process, and laid them aside for other uses. Cover the bowl of fruit and sugar, the top layer being sugar, and set aside, in a cool place, until the next morning. Then slip all carefully into your granite or porcelain preserving kettle, place over a fire, and bring to a boil as quickly as you can; set where they will just simmer, and as soon as the peaches are tender and clear, lift them carefully by slipping them on to a flat skimmer with a fork; drain for a second, and put into glass jars; fill each two-thirds full; boil down the syrup until slightly thickened, pour over the fruit, and seal up for use in winter.

Canning Peaches. Give no heed to economists who tell you that it is possible to can peaches without sugar. It is possible to do so, but no one wants peaches in that state. Thus cooked, they are neither fresh, canned, nor preserved fruit. You may put sugar on afterward, but it will not give the same smoothness and delicacy as if the sugar had been cooked in. Pare the peaches, halve them, and drop in cold water. Weigh out a pound of sugar for every four of fruit, and make a syrup by boiling the sugar with a half pint of water to each pound of sugar. Drain the peaches, and put into the boiling syrup, simmer until tender, fill the jars nearly full with the fruit, pour in the juice to overflowing, wipe dry with a clean towel, and seal up at once. A more difficult way, but one which some prefer, is to make the syrup, arrange the fruit in the jars; fill two-thirds full with the syrup, and stand on hay in the bottom of the wash-boiler. Pour in cold water to two-thirds cover the jars, put on the cover of the boiler, and when the water around the jars boils, remove them from the boiler one at a time; fill with fruit and syrup from a reserve on the stove, and seal up without delay. The tops of the jars must rest on lightly while the water in the boiler is coming to a boil. This more troublesome method is thought by some to produce a handsomer article, but whether you wish to sacrifice so much time to mere prettiness, is a matter for your decision.

Peach Cream. This is a most luscious dessert. Rub ripe peaches through a sieve until you have a pint of pulp; put this in a cake bowl with ten ounces of powdered sugar, and a few drops each of almond and vanilla essence; dissolve an ounce and a half of gelatine in half a pint of water, by soaking it first in a gill of cold water, and then pouring on a gill of boiling water and stirring over the fire until dissolved; mix with the peach pulp, and stir in also three half pints of well-whipped cream; put all into a jelly mold; imbed in broken ice; cover with an inverted plate, put ice on top, and set in a cold place until thoroughly "set" like lemon jelly. When ready to serve, dip in tepid water, and turn out on a pretty dish.

Peach Cake. A peach shortcake, made in every respect like a strawberry shortcake, is delicious. A peach layer cake is something to dream of. Make a layer cake with half a pound each of butter and sugar; the creamed yolks of five eggs; six ounces of flour, and two of cornstarch; the whites of the eggs whipped stiff, a teaspoonful of vanilla, two tablespoonfuls of grape juice, and a teaspoonful of baking powder; bake in three deep jelly tins, remove from the pans, and cool for a few minutes on a towel. Beat the whites of two eggs lightly, adding gradually four tablespoonfuls of powdered sugar; when stiff enough to stand alone, put a layer of this over one cake, imbed in it a layer of sliced peaches; place another cake on top, and repeat. Dust the top cake with sugar. This may be eaten for dessert with cream. For this recipe I am indebted to my friend, Mrs. Rorer, of the Philadelphia cooking school.

For Autumn Wear.

No sooner does our eye become accustomed to artificially lengthened corsages and abnormally long waists, than the fickle old lady who is supposed to rule the realm of fashion suddenly veers round like a weather vane, snaps her Atropos shears and chops them off short, decreeing that short basques, belted bodices and Empire effects generally are once more to be admired. In proof, behold the curtailed Eton jackets spoken of last month—which, by the way, dressmakers declare will still be popular for outing suits a year hence—and the full blouse fronts confined by a broad girdle.

There is little doubt, however, but princesse gowns and Watteau plaits are, also, to be leading features of this autumn's style and our maids and matrons will appear like the dainty Louis Quinze beauties which the famous French artist loved to paint on his world-renowned fans. But the flowing Watteau plait is only for the tall, slim girl; her short stout sister must eschew it, as on her it would be bunchy and fussy. Then, provided you have the proper figure, wear it, for it is graceful, and the very "tip of the mode" for the bride's wedding dress, the belle's evening gown, the dainty silk carriage wrap and above all, for the tea-frock or negligee costume that one revels in at home.

The dear, little plump "pocket Venus," however, need not repine that she cannot be "Watteau-esque," for she will be quite as attractive in her pretty bodice gown with straps of ribbon tied in jaunty little bows on her shoulders, or the more masculine suspenders fastened with black or steel buckles; while the trained, princesse dress will suit her to perfection, giving the effect of height and dignity. The ribbed, striped and corded dress goods that have rather languished in abeyance throughout the summer, will resume their popularity, especially the grey and heliotrope Bedford cords, and the general rule for garniture is to trim them with silk or velvet of the same shade as the woolen fabric; while dressy costumes have yokes of lace, that are rounded, square in effect or pointed downward and outlined with bretelles. A novel and excellent idea is to have a removable yoke fashioned of lace or embroidery and edged with a frill. This, then, can do duty on several gowns. With the old laces, antique jewels and heirlooms come to the fore and Parisiennes are hunting out their grandmothers' long chains of gold and pearls to wind about their necks or convert into chatelaines for carrying fan or flowers; while old-fashioned, flat bits or jewelry—long considered too antiquated to wear—are used to hold sashes and ribbons in place.

At the time of writing it is a little early to speak definitely as to the shapes of fall hats, but the dark straw and felt Alpines, sailors and low crowned walking hats will hold their own until the end of October. The latest mode of trimming is to roll the velvet or ribbon used twice around the crown, with a space between the twists, and finish with a large bow at the back or on the left side. Two colors may be so arranged or only one. To this may be added, if liked, a bunch of the jetted feathers known as the Mephisto plumes. They are worn on both round hats and bonnets.

These demi-season hats are apt to be trimmed at home, and the amateur milliner living in the city can have the latest style of bow tied for her at the shop where she purchases her ribbon. Not so the woman who dwells far from the business centers and for her benefit we give the manner in which two of the bows now most worn are made by an expert.

For one bow, one and a half yards of soft ribbon, from four to five inches in width, is used. Cut from this a length of twelve inches. Take the remainder and mark the exact middle of it. Next, measure and mark fourteen inches to the right of the center, and twelve inches to the left. Fold the ribbon across at the middle mark, wrong side out, and thus doubled shirr it across and draw it in about one inch. In the same way fold the ribbon across at the other marks, lay the two folds together and gather them, drawing the ribbon into the same space in the middle. Lay the second gathering under the first one, tack them firmly together and you will have a bow with two loops and two ends. Pull the ends so one will be above and the other below and cut one slanting and the other in a dovetail. Now, of the twelve inch piece form another loop. Lay the ends together, gather them, fasten under the gathering in the bow and arrange so that it inclines toward the left. Be careful not to crease the loops flat and avoid anything like stiffness.

For the other bow three yards of from five to six inch ribbon are required and it is made on the hat. Take twenty-eight inches of the ribbon, fold the ends to the middle, on the wrong side; then lay two pleats in the ribbon reducing it to less than half its width. Tack this bow to the crown so that the lower edges of the loops will be straight at the bottom, the upper edges standing up. Near the ends of the loops, catch the under sides to the hat crown but avoid stiffness. For upright loops take two pieces of ribbon, one eighteen inches long and the other twenty. Double one end of each over to form a loop, six and one-half inches in length, lay two or three pleats in it to bring it into the smallest space and tack them edgewise to the crown, just at the top of the bow on it. But before sewing on, place upright inside of each loop a bit of doubled wire to keep it in position. The ends below can be cut of any preferred shape or length. For a cross knot use thirteen inches of ribbon, pleat one end closely, tack it to the crown at the left of the loops give it a loose turn forward of them, then twist tightly back of them and secure the other end underneath.

October Delicacies.

Mushrooms are preëminently a fall delicacy, abounding in fields and pastures in certain localities from August until October. On a farm in Sullivan county, N. Y., the meadows were full of the finest mushrooms which were quite ignored by their possessors who were ignorant of their use.

Stewed Mushrooms.—Peel the mushrooms, cut a slice from the root end of the stem, and break them in pieces; soak in cold water to which a little vinegar has been added: drain, put in a saucepan with a tablespoonful of butter and one of water; simmer until tender; add a gill of milk, or cream and dish. This is delicious also if the sauce be slightly thickened and poured over thin bits of toast.

Baked Mushrooms.—Peel the largest mushrooms and remove the stem. Have ready a piece of toast the size of the mushrooms, one for each; place the bits of toast on a baking dish, a mushroom, top down on each, season with salt, pepper, minced parsley and dots of butter, bake ten minutes, basting with butter, and transfer to a hot dish. Some add a few drops of lemon juice after they come out of the oven.

Frosted Pears.—These make a beautiful dessert. Stew any number of fine pears, whole, in a syrup made of two cups of sugar and a gill of water; when tender take out and lay on a sieve in a warm oven to thoroughly drain. Beat the white of an egg stiff; add a quarter of a pound of powdered sugar, a tablespoonful of lemon juice and a few drops of cold water. Beat the mixture thoroughly until it assumes a thick cream-like consistency. Cover the pears with this mixture and set in a cool oven to stiffen.

Chocolate Pudding.—Beat four ounces of butter to a cream with one cup of powdered sugar; add the well beaten yolks of two eggs and half a cup of milk; stir in two scant cups of sifted flour with two scant teaspoonfuls of baking powder; flavor with vanilla and add one ounce of chocolate that has been melted by placing it over boiling water; beat this in well and also the whites of the eggs whipped to a stiff froth. Bake this in three layers and when cold put chocolate or boiled icing over each; pile them up like a jelly cake and serve as cake or as a pudding with whipped cream.

Ham Toast.—When you near the end of a boiled ham, chop fine all the meat that would not have sliced nicely; put a pint of milk over the fire with a tablespoonful of butter, and when it boils thicken with a heaping tablespoonful of flour wet with cold milk; add two cups of minced ham; simmer a moment or two and pour over neat pieces of butter toast.

Sardine Salad.—Remove the skin, tail and vertebræ from a box of mustard sardines; lay the halves all one way and side by side on a dish; sprinkle them with a few drops of vinegar if you like them tart; surround with lettuce leaves and spread a mayonnaise over the fish. Celery cut in half inch bits may be mounded about them instead of lettuce, either of which should be crisp.

A Tale of Fable-Land.

GEORGE A. MARTIN.

"O, Uncle George! Please tell us a story" cried Mabel. "Papa is in the library, writing, and it's most bedtime."

"Please Unky Dord," pleaded little Bessie climbing into his lap, where she knew she was always welcome.

"Yes," added Frank, "something about grizzly bears and antelopes and mountain lions."

"O, dear!" cried Mabel, "I think bear stories are dreadful."

"Girls all do," said Frank. "Well, please tell us a girl story then," he added, as he seated himself near his uncle, while Mabel drew up an ottoman on the other side.

"Well, children, who will tell me where Fableland is?" asked Uncle George.

"I guess it must be in Africa," replied Mabel. "There is Barntoland and all sorts of lands with funny names, but I never saw it in my atlas."

"No, you will not find it in your atlas. But it is a wonderful land. Cats and dogs, foxes, storks and all kinds of animals talk there, and when any of them does or says anything remarkable out pops a fellow called Moral, and solemnly explains what it was all about."

"I know where Tableland is, now!" said Mabel. Frank looked very conscious and Bessie only gazed in open-eyed wonder.

"Once there was a cat" continued Uncle George. "His name was Tommy. He was a Maltese cat, and all called him a good mouser, which means that he caught a good many mice. He was very active also, if a bird or a squirrel ventured within reach of his sharp claws. One afternoon in May, Tommy sat out on the sunny side of the house with his paws curled under him, lazily watching, through his half closed eyes, the squabbling sparrows, and a pair of busy blue-birds which were building a nest in the hollow of an old maple near by. Just beyond the rail-fence, in the meadow, a robin was hopping back and forth, stopping every few minutes to make a sudden dash at a worm or bug he had seen among the grass-roots. Tommy's eyes were now very wide open. Creeping slily through the fence and along the meadow, he lay close to the ground for a moment, with quivering tail, then made a spring for the robin. But the bird was gone, and in the place where it had stood was a large hole into which Tommy plunged headlong. Down, down, he went, until at length he struck square upon his feet at the bottom. For a few moments he stood there, dazed. Then his eyes became adjusted to the dim light, and he crept cautiously along a passage which led from the hole down which he had come. Poor Tommy had tumbled into Fable-land. At the end of the passage was a strong door, with a round hole near the bottom quite large enough to admit Tommy. He felt sure there were mice about, and creeping up to the hole, he peeped through.

"Suddenly something dropped down beside him, he was seized by the neck, with a strong grasp, and a cord was thrown around his waist. Tommy turned his head, and there stood a mouse; but such a mouse! He was larger than Tommy himself; he walked erect and was dressed in a pair of baggy knickerbockers, a long waistcoat and a short-tailed jacket; his head was topped by a funny looking peaked hat, into which was stuck a plume of blue-bird's wing-feathers. He carried a small gun, with a sharp and shining bayonet fixed upon it.

Tommy would have pitched at his captor and fought it out on the spot, but the muzzle of the gun was dangerously near his head, and when he tried to back away he found that the other end of the cord around his waist was held by two other mice as large as his captor. They pulled at the cord with all their might; the armed mouse went behind Tommy and pricked him with the sharp bayonet, and the prisoner could do nothing but plunge through the hole and go wherever he was led. He soon found himself in a room which looked wonderfully like the cellar of the house where he lived. At one end of it was a low table beside which sat a wise-looking old mouse with spectacles on his nose, and a plumed hat on his head. Tommy was led up to the table, while the two mice which had been leading him sat down beside it, one of them taking up a book.

"So far every thing had gone on in silence, but now the armed mouse spoke. 'Your honor,' said he 'we have at last caught that murderous cat.' The grave old mouse looked sternly through his spectacles and said, 'Well sir, you are charged with the wanton and cruel murder of many members of our family. What have you to say?' 'Please your honor,' said Tommy, 'I never caught a mouse except when I was hungry. Cats must live.' 'Did it satisfy your hunger to torture the mice, and play with them, before you put them to a cruel death?' Tommy dropped to his knees before his judge, folded his paws across his breast, and cried, 'Mercy, mercy! your honor, and I'll never catch another mouse.' "You never had any mercy on your own captives,' said the judge sternly. Then turning to his attendants he exclaimed. 'Away with him. Take him back where he came from, and turn him into a mouse,—such mice as they have there, — and turn him loose, to be the prey of the first cat that finds him.'

TOMMY DROPPED TO HIS KNEES BEFORE HIS JUDGE.

"How funny," said Mabel, "I thought the mouse-judge was going to hang Tommy."

"Well," said Uncle George, "the two mice beside the table sprang out and seized the string that bound Tommy, the armed fellow gave him an awful prick and then Tommy commence to struggle but the mice held on hard although he nearly got his claws upon them. They could not get him through the hole where he came, because he stuck his sharp claws into the floor, and they were obliged to get four more of their number to hold the string before they could manage him. Slowly they dragged him back through the hole but the minute he was through he turned upon them again, only to be met by the sharp point of the bayonet which pricked his nose very sharply. Then he lost heart and rolled over on his side, letting them drag him where they pleased.

"'Say, this is hard work,' said one of the mice.

"'That's so, let's kill him now, what's the use of tiring ourselves all out dragging him along,' said another.

"'But you know the judge said to turn him into a mouse and let the cat kill him,' said the first mouse.

"'I don't care,' said the mouse with the bayonet, 'I'm going to kill him now,' and he jumped upon him and—

"That instant Tommy found himself sitting on the sunny side of the house, with his paws curled under him. The sun was nearly down, the cows were coming up the lane from the pasture."

"O, dear, he was saved then," said Mabel.

"Of course he was," said Frank.

Bessie made no remark, for she was fast asleep.

A Useful Monkey.

H. E. SMITH.

Rarely, indeed, can any member of this lively and mischievous tribe be commended for usefulness, but to one little specimen of the South American family of Howlers must be given that praise. An English traveler had captured one of these monkeys, while but a baby, and made a pet of her, under the name of Donna Chiquinha.

During her long rides upon mule back the little Donna regularly took her place upon the mule's head, perched between his ears. At first the mule did not take kindly to his extra rider, but he and the Donna soon became attached friends, for they had the very best ground for friendship—each could and did render useful service to the other.

The vast woodlands of Brazil are subject to a very great pest called the Motuca fly, which, as long as daylight lasts, follows and unmercifully persecutes all animals, save man and monkeys. Particularly do horses, mules and cattle suffer from its bites, which, like her sharp prick of a lance, draw blood every time. Donna Chiquinha—with a gratitude which does her credit—soon saw that in return for the rides which she enjoyed so much, she could render the friend, the mule, a service, by killing the flies which tormented him. She was very small, but being very lithe, or long-armed in proportion to her size, she could reach far. Sometimes she would hitch her tail firmly round one of the mule's long ears, and hanging herself from this, as from a pillar, would use both her tiny hands to clean the flies off of the mule's cheek, nostril, and neck on one side, and then climbing over to the other ear would repeat the process on that side. The flies were so numerous that the little Donna was kept incessantly busy. The mule appeared to know well what she was doing, for he would always keep the ear from which she was suspended perfectly erect, in order to help her as much as possible. Their master thought that it was chiefly owing to the Donna's exertions that the mule was enabled to finish his very long journey in much better condition than any other mule of the troop.

The Dreams of the Red Man.

LUCY ELLIOT KEELER.

Dreams are to the primitive Indian a universal oracle. They reveal to him his guardian spirit, teach him the cure of his diseases, warn him of the devices of sorcerers, and guide him to the lurking places of his enemies. The dream is regarded as a direct communication of the great spirit, disobedience to the slightest behest of which will bring down a curse to which death is incomparably trifling.

At the age of fifteen, the Indian boy blackens his face, and retires to some solitary place in the forest. Here he continues for three or four days, only breaking his fast by powerful decoctions with which his family has supplied him. Thus weakened physically, disturbed by the break in his hitherto wholesome life, excited by expectations of divine revelation, his intoxicated brain fulfills the missions expected of it. The boy dreams. He imagines himself flying through the air, walking below the earth, or swimming the deep sea. He has interviews with the Manitous who inform him what he was before his birth and what he will be after death. The fate of his life is shown him, and he takes the name of the animate thing which has prevailed in his dream, and looks to it throughout life as his guardian spirit to counsel, guide and protect. An eagle or a bear is the vision of the destined warrior; a wolf of a successful hunter; while a serpent foreshadows the future medicine man. Cass writes that he knew an old Dakota chief who was greatly respected but had never been to war, though belonging to a family of peculiarly warlike propensities. The reason was that in his initiatory fast he had dreamed of an antelope—the peace spirit of his people.

In return for his care of the Indian, the Manitou is said to require of him the constant performance of certain acts. These are called "medicines" and are likewise revealed in dreams. Some Indians will strike the butt of the pipe against the ground every time they smoke; others will insist that everything they say shall be interpreted by contraries; and one old man conceived that he must compel every white man he met to drink a bowl of water. Parkman visited an Indian who was particularly unfortunate in his allotment. The spirits had told him in a dream that he must sing a certain song in the middle of every night; and, regularly at 12 o'clock, his dismal monotonous chanting would awaken his visitor who would see him seated bolt upright on his couch, going through his dolorous performance with a most business-like air.

The Indian's trust in the potency of dreams is unfallible. A Dakota warrior once refused to go to war, on which his heart was set, because "one of my young men has had bad dreams. The spirits of the dead he was about to revenge, came and threw stones at me in my sleep." Champlain's Algonquin allies daily beset him to tell them his dreams. When he once replied that he had beheld the Iroquois drowning in the lake the auspicious vision was received with shouts of joy. A substantial record of this belief in dreams is the tract of land in New York still known as the Royal Grant. Sir William Johnson, an Englishman who had almost unlimited authority with the Five Nations, once gave a feast at which Hendrick, chief of the Mohawks, was present. Johnson had received from King George several military dresses, gorgeous in scarlet and gold, which were shown to the guests. The next morning Hendrick told his host that he had dreamed that night, that one of the dresses had been given to him. "You shall have it," was the prompt reply of the diplomatist. As a subsequent entertainment tables were turned, for Johnson told Hendrick he had dreamed that the chief had made him a present of three thousand acres of land describing its locality. "You shall have it," the Mohawk replied, "but I will never dream with you again. Your dreams are too hard."

In the middle of the seventeenth century, a little company of Jesuit missionaries settled among the Iroquois and labored for their conversion. In return, the Indians decided to put them to a lingering death. Among the French was a young man who had been adopted by an Iroquois chief. He now told his Indian father that it had been revealed to him in a dream that he would die unless the spirits were appeased by a magic feast. The characteristic feature of this feast was that the guests should devour everything set before them, however inordinate in quantity. A day was accordingly appointed for the sacred festivity. Beasts were killed and stores poured forth for the common cause. After the dance and games of skill, the serious business of the night began. Kettles were brought in and their steaming con-[illegible]ts ladled into the wooden bowls which each [illegible]st had brought with him. It was a point of [illegible]or not to flinch from the duty before them, [illegible] they gorged themselves until nature had reached her limit, and the young Frenchman declared the spirits were appeased. The victims soon fell into a heavy sleep, and the young man and the Jesuits stole away to their hidden canoes by the lake, and rowed for Montreal. By morning, snow had fallen, obliterating all footsteps, and as Mr. Parkman suggests, superstitious awe seized the Iroquois and they believed that the "black-robes" and their flock had flown off.

The Shaking Minarets of Ispahan.

HELEN EVERSTON.

Among the most singular architectural curiosities in the world must be counted the Shaking Minarets, about five miles from "sacred Ispahan." After passing through a perfect sea of gardens and irrigating canals, the traveler reaches an old, and by no means imposing looking, mosque. From the front corners of this rise two columns of masonry about seventy feet in height from the ground; the first half of the height, or a little less, being one with the walls of the mosque. After reaching the roof of the mosque the two minarets raise their tapering heads some thirty-five or more feet as isolated spires, and distant from each other about twenty-five feet. A narrow, spiral staircase winds up inside of each column to the top. So far there has been nothing remarkable, but, arrived at the top of either one of the columns, by dancing or jumping upon the floor, the minarets can be made to shake as though trembling from earthquake shocks. What is still more surprising is thus told by Mr. Ballantine in his book—"Midnight Marches through Persia":

"We got a couple of Persians to ascend one of the minarets, while we were on the top of the other. Here we sat down, perfectly still, and notified the Persians opposite to shake the column they were on. They did so, throwing it nearly a couple of feet, I should say, out of the true vertical on each side as they moved. This shaking, by some mysterious connection through the solid masonry of the mosque, communicated itself to the column we were on, and it in turn began shaking so violently as to oblige us to descend to seek relief." Whether this "sympathetic motion" of two solid and separated columns of masonry be due to accident or design is not now known; neither is the manner in which the motion is communicated. The superstitious Persians attribute the phenomenon to the spirit of the mosque's patron saint, whose body was interred below.

Persepolis, the Ancient City.

E. V. STONE.

A hoary city before Nineveh or Babylon were founded, and perhaps contemporary with Baalbec, was the ancient capital of Persia, the city of Persepolis. Like Baalbec, it is reported to have been built by genii, under the direction of "Jhan-bin-Jhan, a monarch and giant, who flourished before the flood, or who constructed this city for the purpose of holding in its massive vaults his untold riches. Its desolate, silent ruins of uncounted age, are of great magnificence. An imposing flight of stone steps," up which a squadron of cavalry might march with ease," leads to the place of a palace, "fifteen hundred feet long by nine hundred and thirty-six feet wide, built in the form of a terrace, and covered with the debris of broken, fluted columns, bits of sphinxes, bas-reliefs of chariots, horsemen, kings, queens and their attendants, in a variety of costumes, warriors in coats of mail, forlorn captives, implements of war, vessels for royal banquets," and other things from which antiquaries laboriously endeavor to construct a history of the silent past. At the immense entrance to this palace stand two of the winged and man-headed bulls with which the explorations at Nineveh have made us familiar, flanked by a few towering, magnificent columns, the survivors of a full hundred.

Before these fallen columns once marched the warlike hosts of Cyrus, Xerxes, Alexander, and many another monarch, unknown to fame, who once deemed that he had filled the earth with his glory. To-day one would care less to be told of them and their pomps than to know something definite of the civilization, the artists, or the engineers who labored to such purpose, and left behind them works so full of grandeur and of spirit. Specimens of the man-headed bulls of Nineveh may be seen in the Louvre at Paris. Majestic in their eternal repose, they yet seem full of life, wakeful, watchful, ready at some word of lofty command to move forward at the head of conquering troops. They are symbols of remorseless and irresponsible mental and physical force, upon which we gaze, shuddering and fascinated.

Shark Fishing at Nantucket.

ISABEL GORDON.

If you never went shark fishing—and I have an idea some of you don't know anything about it—you cannot imagine what fun it is. One bright breezy morning we started from Sconset Beach in a jogging wagon, or, rather, a series of wagons, for there was quite a party of us. What a ride that was over sandy moors! Here and there we passed dark pools, where grapevines grew in perfect thickets, where great red wild-lilies flaunted all around us, and the air was sweet with the fragrance of swamp apple blossoms. The sharks! ah! we will reach them soon, but first we camped down on the sandy beach at Nantucket, where clams did congregate—and hungry people. Then an old whaling captain took us under his wings—or fins, I should say, for he talked and smelt and looked very fishy. Seated in a light dory, we waited at the edge of the surf for the wave which should carry us out. At last it came. Our captain pushed out, and away we went riding out to sea, now on the crest, then on the trough of the great waves. A quarter of a mile beyond, an old whaling boat lay at anchor, which was too crazy to go to sea, but safe enough to land sharks in. When the dory got alongside, we clambered in, and then the sport began. The captain baited our lines, which looked strong enough to catch whales. On the big barbed hooks he put six or eight perch. We threw out our lines, and soon we were watching for the sharks, which came one by one, with scattering gleams of white light, to the side of the old boat. At last I had a bite, and soon all hands were at my side tugging and pulling. Our victim was a tremendous man-eater. He lashed the water with his powerful tail until the waves around grew red with his ebbing lifeblood. His struggles became fainter and fainter, and then we pulled the great white-bellied monster aboard all quivering and bleeding. That was our first catch, but when we went ashore we took with us six tre-

mendous fellows, which flopped and whacked around the boat. I would not own up to being a coward, but nobody felt very easy with those great jaws on every side of us snapping like castanets. It made one feel what a horrible fate it would be to come in nearer proximity to those glistening rows of cruel teeth. One memento of that sharking expedition are a few of those wicked looking teeth which are set in rows of three around the ravenous mouth.

The Digger Indians and Their Food.

MAGGIE DOWNING BRAINARD, CALIFORNIA.

The Digger Indians when first found, living on and along the mountains of California, were considered the lowest type of the red man. Depravity was stamped on every feature. They were low of stature, thin, and exceedingly ungainly in form. Their diet was grasshoppers, white-oak acorns, and the sugar-pine nut. Grasshoppers were either fried in their own grease, or dried, pulverized and mixed with acorn meal. The catching of these grasshoppers was quite a science with them as well as a great sport, enjoyed by the Indians. Twenty-five or fifty natives would form themselves

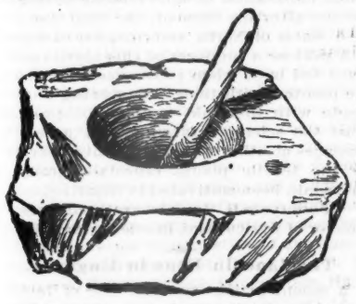


FIG. 2. DIGGER INDIAN MORTAR.

in a circle, armed with long, light sticks, and surround a stretch of country, covered with low grass or wild oats, in which the little whirring insects lived by the millions. A leader of the band gave a signal and slowly, but in unison, they began to beat the grass, driving the hoppers all to the center. When myriads had thus been collected, the grass was set on fire, which in a second burnt, leaving the hoppers, with scorched wings and legs, helpless captives. Then every Digger pitched in, independently, for his supply. When thoroughly dried, they were rubbed to a powder and added to acorn meal. This latter was prepared by heating the acorns in a hollowed stone, called a mortar, with a long, tapering stone pestle. Stews and soups, made of this mixture, were considered their rarest dainties, the grasshoppers giving a rich, creamy flower, highly prized by them. These preparations were boiled in waterproof baskets made of root fiber, in a most original manner. Stones were heated red hot, and plunged into the mixture. As they were cooled, they were taken out, to give way to others of a boiling temperature and so on, until the cooking was complete, and the feast ready.

The surest and most essential article of food, however, was the sugar-pine nut. In the Sierra mountains, where nothing else would grow, towered the sugar pine. This pine grew to the height of 250 to 300 feet. From broad-spreading branches near the top, hung cones in the form of a sugar loaf, measuring from 12 to 14 inches in length. These contained rich, creamy nuts under thin shucks. When the bark was peeled from the tree, a sweet juice was found between the inner tissue and the hard wood, that granulated into sugar. A pitch exuded from the cones, that formed a perfect coating on the outside, and sealed the nut core securely from outward harm. At a certain time in the fall, the Diggers congregated in regular camping settlements to harvest these cones. The work was done mostly by the squaws. They piled the cones in firmly-compressed stacks all over the sides of the mountains, which as winter came on were imbedded in the deep snows. Here they remained perfectly safe. When they wanted to use them, they dug them out, made a big fire, and, as it burned to embers, threw the cones on the coals to remain until the pitch was consumed. They were then raked out and laid in the sun, where in a few days they expanded, and the nuts freely shelled out. Diggers were never found without a supply of these nuts in their waist-belt. [A Digger Indian home—engraved from a photograph—is seen in Fig. 1. In Fig. 2 is shown a stone mortar for grinding acorns and other material; in Fig. 3 a waterproof basket in which food is cooked.]

Living Springs.

The Hebrew prophets compare the love of God in the hearts of men to living springs, "making glad the waste places." This is an expression full of meaning to inhabitants of Asia, where streams and lakes are comparatively few, and fertility depends so largely upon the neighborhood of springs of water. A traveler gives an account of a truly wonderful spring in the island of Bahrein in the Persian Gulf. He says the island is glad with vineyards, date-palms and gardens of almonds, oranges and pomegranates, and all due to a large spring which feeds numerous irrigating channels, making "the desert places" literally "to blossom." "The eye follows the little water courses as they thread their way off from the main channels, along the green hedges, running in and out of the groves and vineyards, encircling each tree and shrub laden with drops more precious than pearls." The spring which is the source of all this beauty and fertility is of great volume and remarkable clearness. As the island is small and

FIG. 3. WATERPROOF BASKET.

but a few feet above the level of an exceedingly salt sea, the origin of the spring is a subject for the wonder of the natives and the investigations of foreigners. English engineers have ventured the opinion that the Bahrein spring is fed by a subterranean and sub-marine spring some hundreds of miles in length, originating in Arabia.

Fig. 1. A DIGGER INDIAN HOME.

The Origin of Australian Soils.

Victoria presents no striking geological features of which counterparts cannot be found in other parts of the world. Representatives of many of the formations known elsewhere are wanting, or occupy insignificant areas, though it would appear that some of these were once present, but have been subsequently removed by denuding agencies; others are perhaps concealed by overlying beds. The principal gaps are those which in other countries are filled by the eocene beds of the tertiary, by the cretaceous rocks of the mesozoic, and by the permian and carboniferous strata of the paleozoic eras. If we examine the geological sketch map of the Colony, we shall see that, roughly, one-third of its surface is occupied by the older sedimentary rocks, largely developed from the east, northeast and north towards the center, and tapering off westerly towards the South Australian border. Another third is occupied by the Murray River tertiary plains in the northwest, also sedimentary; about a sixth is covered by basaltic or lava flows from extinct volcanoes, lying mostly in the southwestern portions of the Colony and to the west of the 145th meridian of longitude, and the remaining sixth by the coast tertiaries and the mesozoic coal rocks. Our soils have been classed and graded by an American authority, in their order of merit; the first being a soil composed of volcanic ash; the next a mixture of volcanic ash and disintegrated lava; the next a mixture of these and a certain amount of silica or sand drift. The other soils are simply mixtures of clay and silica or sand. The soil of Victoria, when discovered, had all the appearance of being rich, and when tried it more than realized expectations. Only a few years after the first settlers landed "Port Fairy" potatoes won fame on account of their superior quality. These potatoes were grown on the southwest coasts of the colony, districts still famed for the production of root crops. The soil is of volcanic origin, very friable and of a reddish or chocolate color and has proved itself capable of growing all kinds of crops without manure for many years. Even in those parts of the Colony where the yield of the crops is small, the defect is not so much in the soil as in the supply of moisture. As already mentioned the inland northern portions of the Colony do not enjoy such a liberal rainfall as others. In such localities the yield is comparatively light, but the soil is rich, a fact that is proved from the large yield obtained in a moist season or when the land is irrigated.

D. E. Martin, Secretary for Agriculture,
Victoria, Australia.

Southern Arizona.

The Salt River valley, which has more development than any other agricultural region of Arizona, is about 45 miles long, and has an average width of 16 miles, thus containing 450,000 acres. It opens into the Gila valley, both to the east and west. This latter valley really extends clear across the Territory from the east central part to the southwestern corner. In some places it is but a few miles wide, and then again broadens out to a distance of from 40 to 60 miles. Tributary to it, besides the Salt River valley, are the valleys of the Santa Cruz, the San Pedro, San Francisco, Sulphur Springs, and many others. Altogether, there are no less than 20,000,000 acres of land in Southern Arizona that will eventually be brought under irrigation.

This land will produce everything from the hardier grains to dates, bananas, oranges, and other semi-tropical fruits. It is a natural home for blooded stock, the raising of which is just beginning to receive much attention. I have taken a four-year-old team right off from alfalfa, and driven them 65 miles in a day without hurting them. The breeding of blooded horses is in its infancy, yet in the winter races here last December the yearling filly, Blue Bell, trotted a mile in 3:35. In the two-year-old trot the filly Nettine trotted the third heat in 3:31. In the three-year-old trot six heats were required to decide the race, and the sixth, and last heat, was trotted in 2:35¼, and the slowest of the six was in 2:41. This, too, on a track confessedly from four to six seconds slow.

Wheat grown on irrigated land here is equal to the best in the West, and flour from the California wheat commands no higher price. Potatoes from Southern California and Utah are raised by irrigation, the same as in the Salt River valley, and are in no wise superior to those grown here. Our farmers have not been able to grow enough to supply the demand over the Territory, and some have been shipped in for that reason. I use potatoes on my table, every day, grown in the Salt River valley, and there are none better raised in the West, which is noted for tasty tubers.

Among the heavy sheep owners of Arizona are the Navajo Indians, who have 200,000 heads; the Daggs Bros., 60,000; Joe Tappan, 20,000; Scott, 20,000; Perrine Land and Cattle Co., 20,000; Austin & Co., 15,000, and numerous others with from 3,000 and upwards. Over 50,000 head were wintered near Phoenix last winter, and the wool shipments have been over 250,000 pounds. Sheep are sheared twice a year, and the average fleeces are five pounds. The uplands of this Territory are pronounced a natural home for sheep, and Arizona wool stands high in the market for quality. Mutton is not only plentiful, but of the very best quality.

Irrigation is only in its infancy, and, as yet, only a start has been made in building storage reservoirs. Projects of this kind are now being worked, which will be completed in the next five years, and redeeming over 1,000,000 acres of the richest of land. The peach and apricot here ripens from three to five weeks earlier than in California, and in the Denver market last season the Arizona apricot was preferred to the California article as being larger and of better flavor. All the larger fruit orchards are young, as the whole country is new. One three-year-old orchard, three miles northwest of Phoenix, last season produced 203,000 pounds of peaches, and this year the product of this same orchard will be close to 300,000 pounds. There are peach trees in private yards that are 10 and 12 years old, and with almost no care produced 600 pounds of fruit to the tree last season. They more than duplicated that yield this season. Grapes are as large, and, I think, larger than in California. Our raisin grapes are of superior quality to those of the famous Fresno district, as they contain more saccharine matter. The only raisin district in California that can at all compete with us is the famous El Cajon district of San Diego county. Figs from this county took the prize over all competitors at the Mechanics Institute fair in San Francisco in 1890. The first orange grove of any magnitude was planted in April, 1889, the trees being two-year-old buds. Last season they produced half a box to the tree of as fine oranges as I have ever seen, and I have visited orange groves on every part of this continent where they can be grown.

EDWIN S. GILL, Phoenix, Arizona.

Ramie and Jute in Texas.

Near Galveston is the site selected by a chartered company to raise the ramie plant and jute, both of which crops do remarkably well in Texas. The plants require little or no attention in cultivation and when a plat of land is once set out in ramie, four crops per year may be cut. The average yield per acre per annum is about four tons. This country is also well adapted to raising early pears and strawberries. The Cape Jessamine for which there is a good demand, is raised without further trouble than keeping the bushes free from grass and gathering the buds and shipping them. The climate of Galveston is mild and the general surroundings are conducive to good health. The burning heat of summer, as well as the biting blasts of winter, are so far modified by the large bodies of salt water on all sides and the unobstructed and almost continuous gulf breeze, that outdoor exercise can be taken during all seasons without risk to health, and, indeed, without much physical discomfort. The records of the United States Signal Service Bureau at Galveston, extending over a period of more than twenty years, show that the temperature rarely rises above ninety degrees in the summer, and only occasionally falls to, or below, the freezing point in winter. The section of country referred to is a vast prairie land extending from the shores of Galveston Bay to and beyond Clear creek, which, though of great fertility and suitable for all small fruits and truck farming, as well as all our staple products, is now the grazing ground of herds of fat and sleek looking cattle. With the exception of the land at and around Hitchcock, Highland, Arcadia and Dickinson and a few spots here and there on the vast prairie, the balance is idle and only waiting for the industrious and thrifty husbandman to tickle it with his hoe and plow to smile forth its bountiful harvest.

W. L. Lisbony, Galveston Co., Texas.

Agriculture in Brazil.

In Brazil, coffee is king. Much progress has been made in its cultivation in the treatment of the plants, and especially in the preparation of the product by means of ever-improving apparatus. Certain it is, that this culture, in view of the high value of the product, may yet become much more extensive than it now is, by the employment of fertilizers and by attention to greater prolificacy. It is to be hoped that such will be the case, considering the increased immigration to the respective States, whose population in 1888 showed a density of 4.49 and 2.71 inhabitants respectively per square kilometer (about six square miles). Therefore Brazil continues to retain first place among coffee producing countries. The coffee of Amazonas and Ceará is of excellent quality, but little is raised.

Sugar-cane cultivation, second in importance, has likewise not progressed during the past fifty years, except in so far as concerns the introduction of agricultural implements. The municipality of Campos, State of Rio de Janeiro, leads in this industry, which continues to be extensively practiced principally in the States of Pernambuco, Alagôas, Sergipe and Bahia, the principal centers for this product. The populations per square kilometer, of these States are 8.63, 7.85, 5.95 and 4.27 inhabitants respectively. The same cane cultivation, although on a smaller scale, is carried on in all of the States of Brazil.

The fact of the fixedness of the methods of cultivation, although partly explained by the very small density of population, was due also to the influence of slavery, and the short period that has elapsed since the emancipation in 1888 has not sufficed to allow of a reorganization of rural labor under the conditions of freedom; the more so, as reforms in agricultural methods, where they would be possible, would have to be effected by slow degrees, and after confirmed experiments made by agricultural experts.

One of the very remunerative articles of culture, which has always been produced by the bestowal of great care, and with the aid of that simplest agricultural implement, the hoe, is tobacco, which may be classed as a horticultural production derived without the use of fertilizing agents. The renown enjoyed by the tobaccos of Bahia, S. Felix, Minas-Geraes, Goyaz and Para is on a par with the care expended on the raising and preparation of this article.

Cacao growing does not solely consist of the very primitive custom of gathering the product, but for the past fifty years has comprised a branch of culture in nearly all of the intertropical States of Brazil, especially in the States of Bahia and Maranham. The rubber industry is extensive near the Amazon river.

Cotton cultivation became notable during, and sometime after the close of, the civil war in the United States of North America; Brazil reaching fourth rank as a producer of this textile growth; but she fell back when prices declined, the Brazilian planters with their slaves being unable to compete with their old methods of production against the scientific farming and agricultural advantages of other countries. Only very lately have the textile plants, especially cotton and ramie, again been cultivated in Brazil.

Jeronymo H. de Calazans Rodrigues,
Director of Agriculture, Rio de Janeiro, Brazil.

The Lincoln Fens in England.

In a recent article on "The use of fertilizers then and now," attention is drawn to the old lighthouse which stood on the Lincoln Fens, in England, to guide travelers by night over that once pathless desert, but now fertile country. Although a Devonshire man, I know Lincolnshire well. The Dutch king of England, William IV, brought over many of his countrymen, who are the best drainers and reclaimers in the world, to teach us how to drain the Fens. That was the step which made cultivation possible at first. Then came in the

"commercial fertilizers," to grow the roots and the clovers, for the sheep to do the rest. Connected with that reclamation is an interesting fact for us. Some of these reclaimers settled there and brought their cattle and sheep. We trace, today, an intimate connection between the straight wool sheep and the Angeln cows of Holland, and the luster wool flocks and red cattle of Lincoln. Something of the same kind must have happened with other settlers in remoter times. How else can we account for the development, in adjacent counties, of two such distinct types as the Sussex Downs and the Dorset Pink Nose? The settlers from different parts brought the types of animals with which they were familiar, and the "master minds"—the Webbs and Bakewells—did the rest. Our flocks preserve distinct evidence of very remote ancestors. They inherit innate propensities. Jealous care has respected their intense provincial characteristics, developed them, and secured that prepotency which makes the individual types sought after the world over.

JAS. L. WALDON, Devonshire, England.

The Home of the Belted Cattle.

A wickedly sarcastic French writer once described the principal productions of Holland as "*canaille, canaux et canards*, which may be rendered in English as "Dutch, ditches and ducks." But that was the voice of prejudice, or reckless sarcasm. The Dutch are the enlightened and robust people whose achievements in the arts, in commerce, and in the defence of their liberties are marvels of history; their canals are monuments of well-directed enterprise, and the ducks are lost sight of in view of the sleek and useful cattle which graze the rich polders. A peculiarly picturesque and valuable breed is the Belted, four typical specimens of which are represented in the photograph which accompanies this letter. The bull and two cows are prize takers, having been awarded numerous honors at agricultural exhibitions. These belted cattle are of a glossy black, with a broad belt or blanket, of unbroken white around the middle from the shoulders to the hips. In cows the white embraces one-half of the udder. These cattle combine, in an eminent degree, milk and beef. While mainly a deep-milking dairy breed, the steers and dry cows attain great weight, and the beef is of excellent quality. It is an old, thoroughly established race, of great prepotency. When crossed with almost any other breed, the progeny retains the peculiar color marking. These, and the other black-and-white Dutch cattle, have been brought to their present high standard of excellence by generations of abundant feeding and judicious care. Their pastures abound with rich and succulent herbage, and their stables are warm, well-ventilated, and kept scrupulously clean. The breeding is managed with care and skill, and the results are cattle which may well challenge comparison with any others in the world. [The illustration herewith presents an exact reproduction of the photograph sent by our correspondent.]

BELTED CATTLE AT HOME.

A. BIRCKHOLDER, Lienwarden, Holland.

Sheep in Northern Germany.

German sheep are tended with the utmost care. A flock of fine Merinos receives constant attention, and as they represent a great value, they are mostly kept by the nobility and large landholders. Merinos from the celebrated herds of Baron v. Maltzan in Lenschaw, Mecklenburg-Schwerin have been sold at a thousand dollars each to Australian stockmen. The smaller farmers commonly keep the kinds best adapted for mutton and coarse wool for manufacturing homemade articles of clothing, which the women spin and weave. The surplus is sold to dealers. The poor people, not possessing land of their own, have the privilege to pasture a certain number of sheep, or a cow, on their employers' land.

Very substantial structures, built of unhewn stones, with straw thatched roofs, nearly reaching halfway over the low first story to the ground, shelter the sheep in winter. Wide and high double doors swing outwards on both ends of the barn, for safety in case of fire, to drive the flock out as fast as possible, otherwise they huddle together and would rather die, than vacate their quarter. These straw roofs, it is asserted, keep the fodder, stored underneath, in better condition than any other roof covering, be it slate, tile or wooden shingle. A row of feeding troughs, made in the shape of a sawhorse, with cross legs, and a rake-like contrivance in the middle to hold the hay, or other larger feed, are put in at such distances that the sheep can reach them from both sides. An inclosure surrounds each barn to prevent the herd from straying in unwonted directions, and also for an outdoor airing in winter time. Of course, all such provisions are only made where large numbers are kept. Families who own only a few, quarter them as best they can.

The surrounding land belonging to the inland, agricultural cities is divided into sections, which alternately bear crops, or are seeded to pasture. This regular rotation keeps the land in good condition, and the municipal authorities appoint certain officers, who oversee and practically govern the field department. If a city has three main gates or outlets, then three herds are the order, each herd is kept separately in its own district. In the morning the shepherd blows a whistle, when the sheep are let out of the yards by their owners. The sheep find their way alone, go often through several streets, when they gain others, and all are driven or led by their respective shepherd and his faithful dogs to the outlying fields for grazing. In the evening the sheep return, and easily find their way home. In the hot summer months after shearing, they do not return home at night, but are inclosed in a hurdle, moved at intervals, to the different fields of those citizens who have bought the manure. This income goes to the city treasury, which provides the necessary hut for the shepherds, consisting of a movable cart with a covering.

The sheep are never left alone, to care for themselves, although there is no danger of being torn by vicious dogs, which are kept under restraint and not allowed to roam at will. I never heard of taxes being paid on sheep. It may be that individual and more residential cities have such ordinances. Where children are in a family, these gentle domestic animals are great favorites with them, indeed a country place or village without sheep, is not considered in a prosperous condition, and looks like a forlorn, unhabitable region.

E. SELIGER, Mecklenburg, Germany.

Wornout Mississippi Soils.

The rotation, or manner in which crops have succeeded each other throughout the South has been determined, not by any desire to maintain fertility, nor to increase the soil's productive capacity, but almost entirely by convenience. The three shift system, or chop down, wear out, and move away system, has been faithfully followed by the major portion of our farmers; a scientific, systematic, rational rotation, by but few. The time has arrived when a change is demanded. No longer can our originally, kindly and naturally fertile soil, be simply tickled with a hoe, and yet greet the tickler with a smiling harvest.

Continuous cultivation in cotton and other clean hoed crops has not exhausted the soil's fertility, as some writers claim, but simply allowed the humus, that indispensable element of fertility, to wash away. It has gone to fertilize the sea weed at the bottom of the gulf of Mexico. How to best and most economically maintain fertility, and husband the resources of which we are still in possession, if not to increase them, is the objective point, to reach which, every thinking, progressive farmer will bend his whole energies. It is much easier, simpler, cheaper and better to maintain, than it is to create, fertility. It is likewise a fact that proper rotation, coupled with thorough preparation of the soil, thorough drainage on all low lands, and judicious circling or terracing, on all hill lands, are the cheapest and best agencies that can be brought to bear by Southern farmers for the maintenance of fertility. All farmers may not be able to work on the intensive or high manuring system, but no farmer throughout the South is too poor to use all the above means of retaining his little stock of fertility. In fact, the poorer the individual and the greater the impoverishment of his land, the greater and more absolute the necessity for carefully husbanding all his resources. It has been abundantly demonstrated that none of the cultivated plants can be raised on the same land year after year continuously, without completely and entirely exhausting the soil of the peculiar elements of nutrition that are indispensably necessary to the healthy development of that particular plant; even the far famed clover is no exception to this general rule. I mention this fact to meet an erroneous impression that has somehow obtained credence among many of my brother farmers that, where land does not wash, cotton may be raised upon it continuously without injury to the land or prejudice to the crop.

Cotton is no exception to the rule of soil exhaustion. The laws of nature are inexorable. One point to which I wish to call special attention is that the before mentioned humus is the principal element that is lacking, the one thing needful on worn southern soils. Clean cultivation is the cause of this lack, the gradual restoration of this important, nay, absolutely indispensable element, by a judicious rotation is the remedy. As this humus is the key that unlocks the vast stores of mineral wealth contained in the soil and as no soil can be fertile without it, it remains that a rotation that does not return a liberal amount of vegetable matter to the soil is far from being complete.

G. H. TURNER, LaFayette Co., Miss.

Indispensable for Boys.—The AMERICAN AGRICULTURIST is the best paper I have ever read. It is indispensable in any family where boys are growing up.

D. H. DAVISON, Montgomery Co., Ind.

FARMING IN FOREIGN LANDS.

There are 27 agricultural schools, with 726 pupils, in Italy.

The hay and clover harvests of Germany were excellent.

In the German empire there are 869 dairy associations.

The Queensland government is experimenting with the cultivation of hops and olives.

The linseed crop of Russia was 11,805,000 bushels last year, as compared with 13,861,000 bushels in 1890.

Many farmers in New South Wales are giving up growing grain, and are turning their attention to mixed farming.

Prince Edward Island is improving the quality of its live stock, especially horses, and sheep grown for mutton.

Italy's wheat crop is placed at 140,000,000 bushels, as compared with 127,000,000 bushels in 1891, and 133,335,000 bushels in 1890.

The area sown to wheat in South Australia will not be so large this year as last, the season having been late and the ground hard for plowing.

In Palestine the early rains fall in October and November when the seed is sown, but crops will not mature unless the later rains also fall in April.

A storekeeper in England has been arrested for selling New Zealand butter that was analyzed and found to be adulterated with 20 per cent. of foreign fat.

Exports of wheat and flour from Canada averaged 2,993,000 bushels per annum during the ten years ending with 1891. This year they are likely to show an advance.

A corn-husking contest of 500 ears, for $50 a side, took place recently in Australia, the winner's time being 28 minutes 48 seconds, and the loser's time 29 minutes 10 seconds.

The New Zealand government proposes to erect receiving depots for butter at the principal places of export, so as to encourage dairying by shipping abroad the surplus product.

Cultivators and horse-hoes are of rather antiquated style in France, and most agricultural implements there are much behind those of America in utility and durability.

New South Wales had 2,046,000 head of cattle at the beginning of this year, an increase of 137,000 during 1891; 460,000 horses, an increase of 16,000; 253,000 hogs, a decrease of 31,000.

Out of every 10,000 persons in Cape Colony there are 4,403 who are engaged in agriculture, the aggregate number being 672,458 persons, of whom 383,612 are males, and 288,846 females.

The largest number of sheep held by one owner in New South Wales is 550,000 head, and there are 330,000 owned by the Momba pastoral company. There are nine owners who each hold more than 200,000 sheep.

The French minister of finance proposes to impose a tax upon fruit for cider and perry, which will strike both producer and consumer, the former having to submit to all formalities and penalties that apply to drinks.

Sugar-cane has been badly ravaged by grubs in Queensland, nearly half the acreage being destroyed. In one case 700 pounds of grubs were picked from a single acre. The insect is the larva of a greyish-white beetle.

The island of Mauritius contains an area of nearly 435,000 acres, of which 40,000 are planted to sugar cane, 2,000 to aloes, 1,400 to beans, 1,000 to peas, 300 to orchards, and smaller areas to coffee, vanilla, maize and other crops.

Indian wheat was imported into Belgium last year to the extent of 8,700,000 bushels, as compared with 4,350,000 bushels in 1890. Part of this was for consumption in Germany and Switzerland, and all three countries are satisfied with the quality.

The Victoria government finds itself compelled to reduce the bonuses paid for the export of butter. Last year as much as $150,000 was used for this purpose, six cents per pound being paid on all butter that realized over 25 cents in the English market.

Nova Scotia averages yields per acre of 18 bushels of wheat, 21 of rye, 35 of barley, 34 of oats, 33 of buck-wheat, 42 of corn, 42 of turnips, 250 of potatoes, 22 of beans and 2 tons of hay. Fruit growing is limited, except apples, of which the annual yield is about 300,000 barrels.

The Russian government has loaned, to the province of Veronesh, the sum of 1,500,000 roubles for the purchase of winter seeds, and 500,000 roubles to buy grass for feeding cattle. Similar loans will be made to other provinces where the harvest has been unsatisfactory.

Eighty per cent. of the population of Italy is, directly or indirectly, dependent upon her agricultural resources. There are 5,000,000 acres of cultivable lands, of which 4,125,000 acres can be irrigated. The farmers feel keenly the competition of the farmers in Russia, Hungary and India.

The oranges of Paraguay are very similar to those of Florida and California in size and flavor. The tree begins to bear at five years old, and there are thousands of trees over sixty years of age that are as prolific as ever. The exports of oranges last year were over 65,000,000, valued at $82,000.

New Zealand has 207,000 milch cows, producing 75,521,000 gallons of milk annually. The milk consumed is valued at $3,570,000, butter $3,058,000, and cheese $580,000. While there has been a slight increase in the quantity of butter exported from this colony, no progress has been made with shipments of cheese.

Arrangements have been made with the regular mail steamship lines to run extra steamers between Tasmania and London during the fruit season, so as to afford space enough for all shipments offering. It is estimated that 300,000 bushels of apples will be shipped next season, beginning about March, 1893.

The success of American tobacco seed planted in Germany is noteworthy. Samples of last season's growth in Alsace, from Connecticut and Maryland seed, were found to be excellent. In all essential respects the conditions of soil and climate in Germany are similar to those which prevail in our Middle States.

The number of miles of fencing in New South Wales is 1,690,000, at an average cost of $209 per mile. There are 32,000 dams used for stock purposes, at an average cost of $412; 33,000 water tanks, each costing $965; and 3,744 wells, averaging $1,145. This total expenditure exceeds $400,000,000 for improvements in stock raising.

Immense swarms of flying locusts have destroyed a large proportion of the winter crops in South Africa. Wheat, winter barley and oats have been completely eaten off, also the sweet grasses, so that little nutritious feed is left for sheep. In some sections the potatoes and corn were damaged, and peas and beans, though spared at first, were finally devoured.

Exports of pigs and cattle from Saxony and Silesia have been prohibited, owing to the spread of foot and mouth disease. Since the English markets have been closed to cattle from Schleswig, Holstein, they are sent to Berlin, Hamburg, and the Rhine provinces, but it is a more difficult matter to find a market for the 50,000 sheep that were exported annually to England.

The finest tea plantations in China are those on the mountain side, neither too warm nor too cool, where the soil is dry, although rains and dews are frequent. The force of the wind is broken, there is a maximum of sunlight, and the surrounding ground is free from weeds, or other vegetable growth. Such plantations are worth enormous sums of money and are controlled by the Chinese millionaires.

In Uruguay there are 400,000 acres under cultivation this year. Pastoral exports have formed ninety per cent. and agricultural exports only six per cent. of the total shipments of produce heretofore, but there is a gradual extension of the agricultural area. Last year's wool clip was rather less than 46,000 bales, and there were 666,000 head of cattle slaughtered in Uruguay, as compared with 801,000 in Argentine, and 455,000 in Rio Grande do Sul, a province of Brazil.

At the end of last year there were 61,882,000 sheep in New South Wales, an increase for the year of 5,845,000. The total number of Merino sheep was 42,719,000 combing, and 17,533,000 clothing, while there were 641,000 long-wooled and crossbred sheep. The total clip of the colony was 45,620,000 sheep shorn in grease, averaging 5 pounds and 9 ounces per sheep; 426,000 creek-washed, averaging 2 pounds 14½ ounces; 1,094,000 scoured, averaging 3 pounds 7 ounces; 10,531,000 lambs in grease, averaging 1 pound 15 ounces; 31,500 lambs washed, averaging 1 pound 4½ ounces; making a total clip for New South Wales, in 1891, of 279,000,000 pounds of wool, an increase of 21,000,000 pounds over 1890. The total Australian clip for this year is expected to slightly exceed that of 1891. Stock returns in Tasmania show 31,000 horses, 168,000 cattle, 1,663,000 sheep, 73,000 hogs, and their produce in 1891 decreased 3½ per cent. as compared with 1890.

The 1891 crop of dried currants in Greece was 160,000 tons of which 140,000 tons had been exported by the close of the year, 16,500 tons coming to the United States. The fig crop was large but of poor quality; tobacco was a good crop and 6,500,000 pounds were exported. There was a half crop of oil, giving 6,000 tons for export at $160 per ton, besides which 2,500 tons of pickled olives are annually shipped abroad, the United States taking about 45 tons as well as 20 tons of pickled citrons.

The area planted to wheat in Ecuador is 40,000 acres, and small farms, from one to ten acres each, are the rule. No machinery is employed to sow, cultivate, gather or thresh the grain. A wooden plow drawn by oxen turns the ground over, the seed is sown by hand and wheat is cut with knives. The treading of horses and mules separates the grain from the straw, and it is winnowed by being dropped through small sieves held in the hand, the wind separating the dust and chaff from the grain.

The value of farm property in Ontario amounts to $1,000,000,000, of which $630,000,000 represent the value of the land, $200,000,000 the buildings, $55,000,000 the implements and $115,000,000 the live stock. The total value of the field crops in 1891 was $125,000,000. The crops averaged, during the last ten years, the following yields: Fall wheat 19 bushels, spring wheat 15, barley 26, oats 34, rye 16, peas 20, corn in ear 65, buckwheat 22, beans 20, potatoes 118, carrots 347, turnips 391, mangolds 427, hay and clover 1½ tons per acre.

The principal products of Bermuda are potatoes and onions, few other vegetables being raised, except beets. Both potatoes and onions are exported to the United States. Very little fruit is raised. Flowers bloom all the year round, and lily and other bulbs are largely exported to the United States. Not more than 50 acres of farm land are usually held by one person, and only British subjects can buy and hold land. Farm wages range from 75 cents to $1 per day. The land is generally let out for an annual rental or on shares.

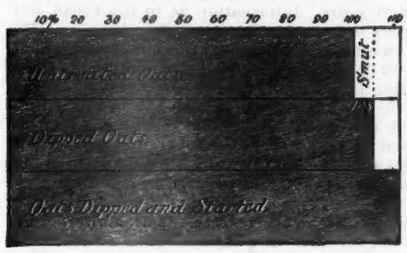
The orange industry in the Bahamas is on the decline owing to the ravages of scale and the competition of Florida and California oranges. The pineapple crop, however, has increased both in quantity and quality owing to the use of commercial fertilizers. The quantity of fruit exported to the United States in 1891 was 510,408 dozen as compared with 476,000 dozen in 1890, but the trade in canned pineapples has fallen off because the American canning factories now obtain the fruit duty free while there is a duty of 35 per cent on the foreign canned fruit.

Australia has a total area of 1,937,000 acres, of which 6,700,000 are cultivated. There are 8,700,000 cattle, 1,400,000 horses, and 76,000,000 sheep. The Argentine Republic has a total area of 729,000,000 acres, of which 14,900,000 are cultivated. There are 16,000,000 cattle, 3,700,000 horses and 114,000,000 sheep. As a pastoral country Argentine is by far the greater. Exports of wool to August 1st were 330,000 bales. The corn crop has been the heaviest on record, and the total value of all agricultural products in Argentine, this year, amounts to $202,000,000, this including what is used for home consumption.

The 1891 census of the Cape of Good Hope gives the following returns of live stock: Cattle 2,211,000, horses, mules and asses 541,000, sheep and goats 23,334,000, hogs 288,000, ostriches 155,000, dogs 303,000, fowls and ducks 2,666,000, turkeys and geese 1,520,000. The wool clip of 1891 was 56,039,000 pounds, and 1,847,000 skins were stripped from sheep. Only 46,000 pounds of cheese were made in the colony, and 2,800,000 pounds of butter. There are 78,575,000 vine stocks, from which 5,130,000 baskets of grapes were made into wine, brandy or raisins; the yield of wine being over 6,000,000 gallons, of brandy 1,423,000 gallons, and of vinegar 137,000 gallons. The total output of farm soap was 2,213,000 pounds, being mostly made in the district where fat-tailed Cape sheep thrive. The weight of fruit dried was 2,613,000 pounds, oranges picked 24,453,000, pears 6,795,000, peaches 21,605,000, apricots 8,882,000, and 25,816,000 other fruits, such as quinces, figs, plums and pomegranates.

SCIENCE IN FARMING.

SMUT OF OATS.—In sixteen recent experiments by J. L. Jensen, of Copenhagen, Denmark, to prevent smut in oats by the hot water treatment, the resulting increase of the crop, as compared with that from unprepared seed, averaged eleven per cent., of which three per cent. is considered due to prevention of smutted grain, and eight per cent. was an extra increase, only to be explained by the greater vitality imparted to the plant by dipping the grain. It is, however, a necessary condition to this considerable extra increase that the dipped grain shall not be be sown till at least four days after having been dipped. A yearly expenditure of nearly two thousand dollars from personal



YIELDS OF OATS WITH JENSEN TREATMENT.

resources, has been for several years devoted to this research by the investigator, who rejoices in the fact that millions of dollars are being annually saved by the hot water treatment of oats alone. The final temperature of the hot water for oats and wheat should be 129° F., for rye 127°, and for previously soaked barley 123°. The dipping in warm water lasts from three minutes in moist climates to ten minutes in dry regions. Dip frequently at first and then more slowly. The hot grain is then placed for two minutes, in a closed box. The grain is then spread on a floor and cooled by stirring.

COST OF WINTERING SHEEP.—The amount of grain and hay necessary to winter sheep has been determined by J. Wilson and C. F. Curtiss at the Iowa Station (B. 18). Ewes were fed from December 10th to February 1st on a grain ration of one-half oats, one-fourth corn, one-fifth bran, and one-twentieth oil meal, the mixture estimated as worth one cent per pound, and on hay worth one-fourth cent per pound. The amount of grain eaten each day by one sheep was: Merinos 0.7 pound, Cotswolds 0.95, Dorsets 0.77, Oxfords 0.95, Hampshires 0.85, Shropshires 0.56, Southdowns 0.27. The daily consumption of hay was: Merinos 1.35 pounds, Cotswolds 1.62, Dorsets 1.76, Oxfords 1.49, Hampshires 1.67, Shropshires 1.64, Southdowns 1.32. The daily cost of feed per sheep was: Merinos 1.03 cents, Cotswolds 1.35, Dorsets 1.21, Oxfords 1.32, Hampshires 1.26, Shropshires 0.97, Southdowns 0.60 cents. Each sheep gained per day: Merinos 0.21 pounds, Cotswolds 0.18, Dorsets 0.12, Oxfords 0.24, Hampshires 0.10, Shropshires 0.10, Southdowns 0.7. All the sheep were registered and coming two years old.

MISSISSIPPI VALLEY INSECTS.—Corn billbugs have hitherto attracted little attention in Iowa, but H. Osborn reports (B. 18) that this year they caused considerable damage. The clay-colored billbug, Sphenophorus ochreus, is rather common, but, from its habits and its depending upon the club-rushes as its food plant in the larval stages, it is not deemed threatening for the future. The little brown billbug, S. parvulus, has been quite destructive, and, as it breeds in a number of grass plants and also in wheat, it is considered as capable of causing serious trouble in the future, while its habits render it difficult to attack. Proper crops which succeed each other can be planned, or the time of breaking sod land so adapted as to prevent as much as possible the injuries of the insect. An application of London purple was very effective in killing strawberry slugs, which was so diluted that it contained so small a proportion of arsenic as to make it impossible for the fruit to retain enough to make it dangerous for food, it being necessary to eat at least six quarts of berries at a meal to get a poisonous dose of arsenic, while probably double that amount would be required if the poison were applied as is usually done. It is recommended, however, that applications of poison be made as soon after bloom as possible, when no possible danger can result. The Diamond back moth, which multiplied largely on rape, causing much damage, is found to be parasitized by a common and abundant species, and a large per cent. of the caterpillars are being destroyed. Spraying with diluted London purple is recommended where the rape is not to be fed to stock for a week or 10 days.

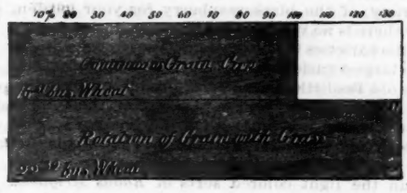
WHEAT BUNT AND OAT SMUT.—The stinking smut of wheat and the loose smut of oats are parasitic fungus plants, the spores of which adhere to the grains and are planted with them, to germinate and grow up in the tissue of the plant, and flower, or rather reproduce spores, in the smutted kernel. The annual loss to the grain crop of Michigan by smut is estimated at upwards of $1,000,000 by P. G. Holden (B. 87). Both of these smuts can be prevented at slight expense by the Jensen or hot water treatment. For wheat, the hot water should be at 134° or 135° F. when the seed is put in. The grain should be taken out in 10 minutes if the temperature does not fall below 133°. If lower than this, the seed should be left in for 15 minutes. For oats the hot water should be at 139° or 140° when dipped, and should be taken out in 10 minutes if the water is not then below 135°, but if lower the oats should be soaked five minutes longer, that the heat may kill all the spores. The expense will be repaid in the greatly increased yield. Grain may be infected without the smut being visible. Smut is mostly blown from the heads of oats before harvesting, and, the smutted straws being shorter than the healthy plants, the amount of damage is often unnoticed.

SILAGE CORN.—Thick seeding and early harvesting were formerly the rule with silage corn. When it was found that nearly mature corn contained more dry matter, a reaction followed. Fully ripened corn will not settle properly in the silo. H. P. Armsby at the Pennsylvania station (R. '91) has found that the use of 40 pints of seed corn, per acre gave an average yield of 41 per cent. more dry matter in the silage than was obtained by the use of 13 pints per acre. The dry matter of the thick seeded corn was five and a half per cent. more digestible than that of the thin seeded. The thick seeded corn produced 47 per cent. more digestible food per acre than the thin seeded. A large late dent corn produced on the average of both rates of seeding, 43 per cent more dry matter per acre than the early dent commonly grown as a field crop in Southern Pennsylvania. The late dent corn ensiled at the same time was three and a half per cent. more digestible than the early dent. The large late dent produced 47 per cent. more digestible food per acre than did the smaller variety. These results are strongly in favor of thicker seeding of silage corn and the use of large stalked varieties, even when these do not fully mature.

DRY FOOD AS NUTRITIOUS AS GREEN.—A meadow or a fodder field produces so much more forage than the trampled and tainted pasture, that under intensive farming, soiling or the feeding of cut green food in yard or stable is often substituted for grazing. As the green food is three-fourths water, there is a great expense in moving it from the field to the feeding pen. The respective food values of green grass, hay and silage have been investigated by J. W. Sanborn at the Utah station (B. 15). Three steers were pastured on two acres of mixed timothy, alfalfa and red clover. An equal area was mowed and fed green to steers in the yard, while another two acres of the same meadow was mowed, air-dried and fed as hay. The three sets of steers, of three each, fed for ninety-two days, one set grazing, one set fed on similar food in the yard in the green state, and one set on the same food, air dried, made equal gains, but the grazed set ate the grass from 28.2 per cent. more land than the set that was soiled. The steers having air-dried food relished it more than those fed on cut green grass, but required slightly more food for a pound of gain. The hay fed steers had the most solid beef, however. Previous experiments (B. 8), had shown that silage was not as nutritious as either pasture, green forage or hay. The summer fed steers required more dry substance for a pound of gain than winter fed steers, the gain decreasing as the warmth of the season increased. From similar feeding experiments, W. P. Cutter has found (B. 16) that dry timothy hay is as digestible as green timothy. These results show that soiling is unnecessary, dry food answering the same purpose; that winter feeding is quite as economical when cattle are fed in stalls or yards as summer feeding in stalls or yards; that grazing is wasteful and that green grass and young grass are no more effective than dry and mature grass or hay. The success of dairymen, who feed their cows nothing but dry hay and moist bran the year through, would also indicate that where the climate is not too moist for the economical drying of forage, that soiling, silage and grazing are not economical.

FERTILIZERS FOR RICE.—The best Japanese rice is grown in the province of Ise, the grains being uniform in shape, large in size, with a smooth, lustrous surface, without spots or wounds. O. Kellner, at the Tokyo station in Japan, has experimented with rice through three years, and, with his assistants, Y. Kozai, Y. Mori, and M. Nagaoka, reports (B. 11) that the lowest yield was invariably obtained from unmanured ground and from those plats which had not received any phosphatic fertilizer, and this result proves that in the Tokyo soil the phosphoric acid is in the relative minimum among the three essential nutrients. Then follows the plats which were not supplied with nitrogen and those without potash, the best yields being obtained from complete manures. The action of unrecovered phosphoric acid on the yield in the second season was inferior to that of freshly-applied phosphate in the first season, but Peruvian guano gave the same increase in crop for two years.

WHEAT CULTURE.—The small particles of rock in all soils are constantly disintegrating and forming new chemical compounds, some of which are used by one crop, some by another, and all increase in the soils during summer fallowing. In rotation of crops, one crop uses what the others do not need, and as all crops add organic compounds to the soil, the manure needed by one crop may be furnished by a different crop. Thus carbon compounds containing much nitrogen are added to the soil by grass crops, and especially by the clovers. W. C. Latta, of the Indiana station, reports (B. 41) the average wheat yield in three rotation series: A five-year course, corn, corn, wheat, grass, grass; a six-year course, corn, roots, oats, wheat, grass, grass; a seven-year course, corn, corn, beans or roots, oats, wheat, grass, grass. The average yield of six crops of wheat grown on land with the above grain and grass rotation was 22.39 bushels per acre. Only 16.31 bushels of wheat was the average yield of six crops grown on land with a three-year rotation of corn, oats, and wheat. The beneficial effects of the grass crops are very striking. For eight years a seeding of six pecks of wheat per acre has yielded most. About September 20th has proved the best date for seeding in West-Central Indiana. Heavy applications of yard manure and commercial fertilizers to a worn soil, growing corn and wheat alternately, have given paying returns. Dipping the seed in hot water did not lessen the percentage of loose smut in the wheat, but did increase the yield six per cent., and was entirely successful in preventing the injurious stinking smut or bunt; likewise increasing the yield. The



WHEAT YIELDS ON GRAIN AND GRASS LAND.

seed grain is poured directly into hot water from 133° to 142° F., and thoroughly stirred. The light bunted grains rise to the surface and are skimmed off, and the remaining spores are killed by the heat. The drill should be scalded to clear it of fungi. Copper sulphate solution destroyed bunt, but not loose smut, but decreased the yield. Changing seed wheat to other parts of the State for one year, and then back again to the experiment farm, made no change in the yield or quality of the grain. Mowing the wheat in the spring to check rankness of growth shortened the straw, made the wheat ripen late, and lessened the yield of both grain and straw. H. A. Huston reports that the use of concentrated fertilizers containing considerable nitrogen made the wheat late, and the summer rains caused an increase of rust.

Milk for Fowls.—M. N. W., Hillhurst, Wash.: Boiled milk, given instead of water to drink, is excellent for fowls that are afflicted with bowel complaints, and when the droppings are greenish-yellow.

Royal Church Raspberry.—Chas. A. Green, Rochester, N. Y., sends us magnificent specimens of ripe Royal Church raspberries, grown on the grounds of the New York State Experiment Station at Geneva. The very large berries are of a bright red color, delicate aroma, and fine flavored. It is claimed to be very hardy, vigorous and productive, and is considered the most promising new red raspberry. It will attract considerable attention next season. The bearing canes are long and loaded with juicy fruit.

Forcing the Gladiolus and Tuberose.—F. F. V., Cordova, Md.: The gladiolus and tuberose may be found to bloom in winter and out of their natural season, but it requires more skill than usually falls to the lot of the amateur florist. If the bulbs of either are planted so late in the season that their flower stems are just coming on as the cold weather approaches the plants may be carefully lifted and taken into the house where the flowers will come on in due season, or late fall or winter months. The bulbs may also be planted in pots any time in summer, provided they have been kept in a dry cool place to prevent an earlier growth, and when so planted their blooming will be delayed until very late in the autumn or winter. The main thing is to keep the bulbs dormant through that part of the season when they would naturally be growing if planted out. There is as much skill required in retarding or keeping plants in a dormant state as in forcing them into bloom out of season.

English Walnut Seedlings.—W. Tudor, Telfair Co., Ga.: Without a full knowledge of all the existing conditions we cannot tell why your English walnut seedlings should suddenly become diseased and die after making a vigorous growth. That your soft-shelled almond died on the same soil and under similar circumstances would seem to indicate that there was something wrong in the subsoil, for the seedlings are not affected until they have become old enough to produce large and deeply penetrating roots. We have never known of any similar instance of nut trees becoming diseased on a gravelly, loamy soil, but your red clay subsoil may be the cause of the trees dying.

Raspberries for Illinois.—L. B. Crocker, La Salle Co., Ill.: You can scarcely go amiss in selecting a variety of the black-raspberry for your garden, for there is no very great difference in the quality of the varieties in cultivation. The Gregg is one of the largest varieties and it is a few days later than the old Doolittle but no more productive or better in flavor. As for yellow raspberries, the Golden Queen ranks first in the list of what are considered hardy varieties, but there are yellow varieties of the Black-cap species which are more hardy than the light colored sorts of *Rubus strigosus*. Ask your nearest nurseryman what varieties have succeeded best with him and, if he is known to be trustworthy, follow his advice in the matter of selection. Soil and exposure often have considerable influence in the success or failure of such fruits, and for this reason it is well for one to look about and see what his neighbors have been doing and note the results.

Twig Blight in the Apple.—A. A. Woolsey, Hamilton Co., Neb.: The sudden dying of the young twigs on your apple trees may be the result of a disease of the sap or the attacks of a small beetle that bores into the young shoots of the present season's growth. But whether the dying is the result of injury by insects or from diseased sap the remedy consists in cutting off all affected twigs as soon as discovered and burning them. If they contain insects they will be destroyed, and if spores of some disease the results will be the same. Had you sent us specimens of the diseased twigs we would have been enabled to determine the cause of their dying. There are several kinds of small beetles that feed on the twigs of apple trees in the Western States that are rarely found in the Eastern, and as the habits of these insects differ widely, our correspondents would aid us much in determining the ways and means of destroying such pests by sending secimens with their queries.

Dimensions of Poultry House.—F. S., Detroit, Mich.: A poultry house, 12x60 feet, is hardly large enough for the accommodation of 100 hens. Doubtless, they could be kept in such a house by taking more pains with them than would be required in a larger house. The usual rule is to allow 10 square feet for each hen. Such a house, if all devoted to use of the hens, under this rule, would accommodate 72. If the house were boarded outside and in, and filled between the boarding with dry sand, it probably would be healthy, though the house would not be so warm as if the sand were not used, and paper were placed on studs, over which covering is nailed, A dead air-space is better than that space filled with sand, or other material. Small lake clam shells will be a fair substitute for oyster shells for poultry.

The Squash Borer.—C. W. Wactlier, Fairfield Co., Conn.: Your squash and pumpkin vines are being destroyed by borers working in the main stems near the roots. These borers are the larvæ of a small transparent winged night flying moth, (*Melittia cucurbitæ*, Harris). These moths deposit their eggs upon the vines close to the roots and the grubs bore into the stems and eat out the pith and softer parts. Their presence is scarcely discoverable until the dying vines leads us to pull them up and cut out the grubs or to search for their cocoons, usually placed just under the surface of the ground at the base of the largest vines. There is certainly no practical mode of reaching the worms in the vines, and the most that can be done is to apply some offensive substance to the hills while the plants are young, to drive away the moths. Coal tar smeared upon corn cobs and laid about among the plants has been recommended, also light application of superphosphate, and similar fertilizers which, while they may appear to be efficacious in some instances, sometimes fail.

Sage for Market.—Martin Smith, Dubuque, Ohio. Sage is raised by the market gardeners near New York as a second crop in the season and the entire crop is gathered at once and not a little at a time, as is usually practiced in private gardens where only a few bunches are cultivated. It is true that the plants are hardy and will live for several years, but for market purposes they are best treated as annuals. The seed should be sown early in spring, and not later than the first of May, and if the soil is rich and the plants given good care they will be ready for transplanting, in July, to ground from which a crop of early pears, cabbage or beets have been gathered. The sage plants are set in rows eighteen to twenty inches apart and about twelve in the row. The crop is gathered late in fall, tied up in bunches, and sold when fresh, or after being dried in the shade. The price is, of course, variable, depending upon supply and demand. If sent from a distance sage should be packed in open crates. Gardeners say that from three to four hundred dollars per acre is about the average for a good crop of sage.

Squash Bugs.—N. C. Purham, Prov. of Quebec.: The insects you found at work on the squash and pumpkin vines are the common squash bug, (*Coreus tristis*). Those you sent were small and immature, and there was also a cluster of eggs on one of the leaves, by the sight of which we were enabled to identify the species. This pest of our gardens is a true bug, and not a beetle, and it lives by puncturing the leaves with its beak and sucking out the juices, and for this reason we cannot destroy it by applying poison to the surface of the leaves, as we could if the mouth parts were formed for biting as in the beetles, grasshoppers and other orders of insects. The only practical way of destroying this insect that we have ever discovered is to go over the vines daily and crush the eggs laid in large clusters on the underside of the leaves. We have tried to drive away these bugs with tar, and other strong and offensive-smelling substances, but with no very satisfactory results. Drenching the vines and bugs with kerosene emulsion or other oily and soapy compounds might destroy them, but this would probably cost more than the crop is worth. In regard to using a separator in the making of butter, we would advise looking about among your neighbors and seeing how they succeed with those implements. You might also consult the markets and ascertain if the sweet cream butter commands a sufficiently better price to pay you for making a change in your present system of butter making. Go slow and be sure you are right before adopting a new system in the dairy.

Paralysis in Fowls.—David Roberts, Ocean Co., N. J., has fowls that eat well, but are taken lame, and finally entirely lose the power of their limbs. Their houses are thoroughly clean, ventilated and perfectly dry. Information as to the cause and remedy is desired. This is possibly due to paralysis, caused by overfeeding, the remedy for which would be to reduce the feed and apply some stimulating lotion to the limbs. Or, it may be caused by rheumatism, in which case the use of a liniment may help. Generally speaking, fowls affected this way seldom recover the use of their limbs sufficiently to be valuable for anything but food. Occasionally, however, they do.

Grapes, Strawberries, etc.—Chas. Mulferd, Butler Co., O.: Without a knowledge of whether the strawberries, grapes and blackberries, are to be raised for market or home use, it would be difficult to name the best varieties. Then, again, if the fruit is to be sent to a distant market, you might require different varieties than for one near by. Fruit that is to be handled roughly, as when sent to market by rail, must necessarily be firm in texture, but for home use the more delicate and higher flavored are preferred. Of strawberries and grapes there is almost an endless variety raised in your State, as elsewhere, and you can scarcely make a mistake by selecting those in general cultivation in your own neighborhood, as described in nurserymen's catalogues. In blackberries there are not so many to choose from, and our preference is the Kittatinny, but it may not succeed as well in Ohio as elsewhere.

Temperature in Incubators.—Miss A. R., Evansville, Wis.: An incubator should be kept where the temperature is uniform. A dry cellar is a very good place. No moisture should be used for ten days, and, if the cellar is damp, none is needed for the first two weeks. The latter part of the hatch, the most successful operators fill the moisture pans. The eggs should not be sprinkled, under any circumstances. The best temperature is 102½°. The thermometer should be tested to see that it is right, for many thermometers are not accurate, and it is possible that the one used is faulty; and, finally, expectations ought not to be too high. An average hatch of 50 per cent. of the eggs is about as much as one gets from hens through a season, and if an incubator does as well as the hens, one should not find fault. The loss of the chickens after they are hatched may be due to being hatched in a feeble condition, or it may be the fault of the brooder. Without a good brooder, the strongest chickens will perish, and it requires more skill to raise the chickens, with the best of appliances, than it does to hatch them.

Clover in Washington.—C. Peterson, Lewis Co., Wash.: Your poor clay soil may need underdraining before it will produce a good crop of clover. For manure you cannot find anything better than that obtained from your stables and barnyard. If this cannot be had in sufficient quantities, then sow peas, millet or some other summer crop and plow under and repeat until the soil is made rich and light enough to produce a good stand of clover. There are many ways of improving a poor soil without any great expense beyond that paid out for labor.

Borers and Asparagus.—Mrs. N. A. Swan, Queens Co., N. Y.: The person who told you that keeping the grass and weeds away from the stems of your apple trees encouraged the attack of the apple-tree borer could not have known anything about the habits of this insect. Of course we do not claim that trees given good and clean cultivation will be wholly exempt from the attack of borers, but it is a well known fact that they are far less liable to be attacked than those which are neglected, having their stems constantly surrounded with grass and weeds. When the

lower parts of the stems are bare and in plain sight we can the more readily detect the presence of borers before they have made much progress in their work. The indolent are always seeking some excuse for their indolence. Asparagus roots should be planted for garden culture in rows about four feet apart, and three feet between the plants in the row. When given plenty of room the stools will increase rapidly in size and produce much larger stalks than when crowded. If your rows are fifty feet long then you will need about seventeen plants for each row. Apply only sufficient manure at first to make the soil fairly rich, working it in with the plow to the depth to which the roots are set, then add more next year, or the year after. It is a waste to apply any more manure at first than is actually required to insure a vigorous growth of the plants, but after the cutting of the stalks begins, then top-dress the bed annually.

Cabbage Lice.—Mrs. P. E. Baird, Dawes Co., Neb.: The common cabbage louse, (*Aphis brassicæ*), may be killed with tobacco applied either in the form of dust or tobacco tea. Almost any form of tobacco will answer for making a strong solution, or tea, if placed in water until the strength is extracted. Dip off the liquid and apply to the plants with a watering pot or garden syringe. The latter is the best implement for the purpose, because the liquid can be thrown so that it will reach the underside of the leaves as well as the upper. Two or three applications will usually be sufficient to destroy the lice. Dusting the plants with sulphur has also been recommended for destroying this cabbage pest, but never having had occasion to try it we cannot speak from experience in regard to its efficacy. However, whatever insecticide is employed it should be applied before the lice are so numerous as to check the growth of the plants.

Winter Vegetables.—John E. Brada, Columbia Co., N. Y.: Before attempting to raise lettuce, cauliflower and similar vegetables in winter for the purpose of supplying your home market, you should read the standard works on the subject, for these were written by men who have had much experience in the business, and it is folly for any one to remain in ignorance where practical information can be obtained so cheaply. By consulting our catalogue of "Rural Books," you will be able to select such as bear on the subject of market gardening. There is, no doubt, money to be made in the branch of gardening in which you desire to engage, but the more you know about it in advance the less likely will you be to make mistakes in practice. Furthermore, as you ask us for advice, we will say, do not begin with the idea that your operations are to be only temporary and if they do not pay at the start you can abandon them, because second-hand sash frames, and other accumulated materials will not bring much at a forced sale. The authors of "Gardening for Profits," and "Money in the Garden" etc., began with little and accumulated much, and we do not know of any good reason why you should not do the same, provided you possess perseverance and the faculty of gaining knowledge by experience.

Saving Frozen House Plants.—J. L. Townshend, Utah writes us: "A sudden and unexpected cold snap last fall froze all the house plants in my sitting-room window. Before building the morning fire I carried all of them into the cellar where the temperature was but little above freezing, and there left them for three days, in complete darkness. Upon replacing them in the window they all recovered without shedding their leaves except the begonias and fuchsias, and even these, although once frozen stiff, threw out new shoots and soon became thrifty and strong."

California Cold Process for Preserving Fruits, Vegetables and Liquids.—In reply to a large number of inquiries about the "California Cold Process," we give herewith the report of Prof. E. W. Hilgard, director of the California Experiment Station, to whom samples of the fruit so preserved have been submitted: "An examination of the sample fruit distributed by the canvassers shows, in the liquid around the fruit, one-third of one per cent. of salicylic acid; which, of course, is well-known to preserve fruit, as well as other vegetable and animal matter, but is better adapted to the preparation of show specimens than to preserve for human consumption. Doubtless there are persons who may, for some time, take such doses of the well-known preservative with impunity; there are others with whom its use would, in a short time, create very serious disorders of the digestion; and there are those whose digestion is stopped, point blank, when such 'preserves' are eaten. Any one is at liberty to take his choice as to which of the above classes he considers himself as belonging, and may take his dose of medicine with his dessert, if he chooses. But should any one desire to do so, it is quite unnecessary for him to pay the "Ohio Fruit Company' at the rate of eight dollars a pound for what he can get at retail for one dollar and a half. Nor need he be alarmed about the fruit company's threat of prosecution. The use of salicylic acid (elsewhere forbidden by sanitary regulations) is guarded by no patent, and never has been; that of Coffee C sugar prescribed by the company certainly is not. All are, therefore, at liberty to sweeten their fruit according to taste, and to spice it with the antiseptic acid without asking leave of anybody."

Troublesome Flies.—C. H., Delaware Co., N. Y., has found that wagon grease and petroleum, mixed will drive away the small flies that annoy cattle and horses in early spring. We had supposed that every farmer of any considerable experience was aware that strong smelling grease was an excellent preventive. We are, however, somewhat surprised at the statement that farmers, in general, neither know nor care where flies come from, but do, at the same time, want "men of brains to tell them a remedy." Any one we fear who has lived to three score and ten without taking any interest in the origin of things, has lived to very little purpose. We must admit, however, that there are men who have lived to a great age and have been tormented, and have allowed their families to suffer every year for at least five months out of the twelve, by mosquitoes, gnats, fleas, and various kinds of flies just because they would not try to learn their origin and spend an hour or two in destroying their breeding places which were within a few rods of their own doors.

Poor Cider.—D. F. R., Washington, D. C.: Cider made from common apples with some rotten ones intermixed, which "is now neither cider nor vinegar," has probably been kept at too low a temperature to allow a further change, or of becoming good vinegar. Suppose you try racking off this cider, placing it in clean barrels, or back in the ones in which it now is. After cleaning, set the barrels in a warm room, or out of doors in the sun for a few weeks and see if it will not ferment again and become vinegar. If you will add a pint of good yeast to each barrel, or a little mother of vinegar, the acetic fermentation will be greatly accelerated. Leave the bung open to admit air to the cider, nailing a piece of wire netting over it to keep out flies, and other insects. Sometimes the first run of cider from the press is too rich and strong to make good vinegar and needs to be diluted with rain water, but the ordinary article, as purchased at the presses, or of dealers, does not usually need any further diluting for such purposes.

Tobacco Culture in Utah.—Subscriber, Ogden, Utah: To fully answer all of your questions about the planting, cultivation, curing and marketing of tobacco, would require a good-sized volume, and when all were answered it might be found that your climate is not adapted to the cultivation of this plant. If you have tried it and know from experience that tobacco will thrive in the cool, dry climate of Utah, then it may be safe to extend its cultivation. We can send you a collection of 14 essays written by tobacco growers residing in different parts of the country, and all for the small sum of 25 cents. In these essays you will find nearly all of your questions answered, but nothing is said about prices, because these are ever changing and are rarely the same two years in succession, supply and demand ruling with tobacco as with other farm products.

Listed Corn.—F. G. Pierra, Kings Co., N. Y.: Throughout the States which border the Missouri river on the west, it is the almost universal practice to list the ground in preparing it for American corn. The lister is a plow with both right hand and left hand moldboards and hence needs no landside bar. The ground in the track of the proposed row of corn is split by the common point of the two moldboards, and a furrow is thrown to the right and another to the left at the same time, covering the unplowed land between the future rows of corn, which land will remain unplowed. If the listing is done late enough for planting, a drill attached to the lister plants the row of corn at the same time the land is plowed. If listed earlier, the corn is planted in the hollow furrows by the usual two-horse corn planter. Thus the field is left in ridges with the rows of corn in the compact seed bed in the long hollow furrows between. Before the corn is up the field is harrowed to kill the sprouting weed seeds. Then with a two-horse cultivator the soil on both sides of each row is stirred and thrown in toward the young plants, which, by the time the corn is laid by, are surrounded with a deep bed of moist earth as mellow as that in the hills thrown up to the stalks on the Atlantic coast. In a dry climate, hilling is injurious, all the moisture being evaporated from the ridge containing the feeding roots of the corn.

Society of American Florists.—The Annual Convention held at Washington Aug. 16 to 19 inclusive, was a remarkable one, not only because the attendance was much larger than was anticipated, but because of its character, based upon its usefulness. It was generally feared, soon after the society's organization, that the social element would preponderate, and that an annual picnic, on a gigantic scale would be the result. While the florists as a rule, are "jolly good fellows," whole-souled to an extreme, the last convention showed plainly, that while its members were enthusiastic in the development of the flower, the importance of intellectual manhood was by no means neglected. The papers read were of a high order, showing deep thought, well applied to the subjects treated; and the discussions that followed were timely, able, and appropriate. In short, the society aims to great usefulness, not only to its members, but to all interested in floriculture. The meeting next year will be at St. Louis. The officers elected for the present term are: Wm. R. Smith, Washington, president; Professor William Trelease, St. Louis, vice-president; William J. Stewart, Boston, secretary; M. A. Hunt, Terre Haute, Ind., treasurer.

Agricultural Products for the World's Fair.—Mr. James Wood, Mount Kisco, Westchester Co., N. Y., has been appointed Special Commissioner of Agriculture for the State of New York. With a view to secure a complete representation of all the agricultural products of New York he solicits correspondence with persons who raise any special crops which are not ordinarily found in the general market.

Poisoning Ground Squirrels.—Thomas E. Williams, Richardson Co., Nebraska: It will not injure the germination of seed corn to soak it in a weak solution of strychnine, just before planting, for the purpose of poisoning mice and ground squirrels, but arsenic will answer the purpose and is much cheaper. It is also a good plan to put arsenic on small pieces of buttered bread and drop these into the holes. These burrowing animals can be killed by pouring bisulphide of carbon in the holes and covering the entrance to prevent the escape of the fumes.

Snow Fences for Irrigation.—John Roth, Ziebach Co., S. D., writes us: The great plains are so level and bare that the blizzards blow most of the snow into the worn out channels of the water courses, where it drains away when melted. In the Arid Region, wherever there is a snow drift there the sage brush grows luxuriantly from the retained moisture. The prairie farmer might retain much snow on his land by building snow fences of poles and boards, and by setting out thickets of trees to hold drifts of snow, which would melt on the farm and, soaking into the ground, moisten the subsoil for the next summer's crop.

Eaves Troughs.—J. P. Nichols, Delaware Co., N. Y., writes: "About 25 years ago, when I built sheds over yard manure and put eaves troughs on the buildings, my neighbors laughed at me, but now nearly all of them have adopted my plan. I have two farms and a saw mill, and a planing mill. I plane two sides of a 4x4 scantling in the planer, then set the table on the slitting saw so it will cut just three inches deep and one inch thick, and then run the scantling through. Turn it down and run it through the other way. The result is a solid eaves trough, which, by placing the lower end in the next length, can be extended as far as needed. A thousand feet can be made in two hours. It can be hung on the eaves with pieces of strap iron. The trough will last longer if painted inside with mineral paint, and kept clean.

AMERICAN AGRICULTURIST
FOUNDED IN 1842

OCTOBER, 1892.

State Aid to Agriculture.

Is there already too much of it? This question is being forced to the front by thrifty and conservative farmers in several sections. We have received numerous letters asking whether Federal and State grants for the promotion of agriculture are not doing more harm than good. One of these letters asks: "Would we have witnessed the present cry for government loans and similar appeals for State aid to individuals but for the system of bonuses agricultural colleges, experiment stations, departments, exhibitions, etc., that has been developed of late years, fostered equally by the old political parties and demanded still more vociferously by the People's party?"

State aid, the effect of which is to encourage farmers to help themselves, is excellent. When it has the contrary influence, such aid is a positive injury. It has been truly said that the people support the government, but the government should not support the people. If the federal grants to our agricultural experiment stations, for instance, lead farmers in the respective States to take an active interest in their work and to insist that it be done to their best advantage, this form of aid is useful in the extreme. But if the Hatch act is to take the place of State appropriations, and farmers get the idea that more money can be had for the asking, no matter how it is spent, the act had better be repealed, for its indirect influence will be bad, and the work accomplished under it will be constantly reduced in value. Fortunately, however, there is little indication that this particular appropriation is viewed in any such manner.

Though it may have been wise in the past, the United States has now reached a stage at which this so-called aid to agriculture, railroads, etc., should be curtailed instead of increased. It was perhaps wise at the time to make generous land grants to secure the building of the first transcontinental railway, but it certainly would have been better for the nation and infinitely better for the section traversed by the Union Pacific, had its construction been under government auspices, direct, instead of through a land bonus. It is for this reason that we look with favor upon the federal government guaranteeing the bonds of the Nicaraugua canal under suitable restrictions as to economic construction and management, instead of having a great indebtedness piled up against this undertaking to serve as a toll on American commerce for years.

State aid should be granted only on the condition, among others, that a certain amount of co-operation shall be necessary to secure it. Thus the Wisconsin system of farmers' institutes, although supported by State at an expense of some thousands of dollars annually, is productive of good results, because the State does simply the executive duty of organizing the work and furnishing some of the speakers, depending upon the locality in which each institute is held to furnish other speakers, to advertise the meeting, supply the hall, work up the enthusiasm, etc. Likewise the weather bureau of the United States Department of Agriculture places the advantages of its daily reports before the communities only that take sufficient interest to co-operate in furnishing the necessary signals and person to display the same. State or federal aid on these lines helps farmers to help themselves and cannot be too strongly commended. Hence, as we have often advocated, sufficient money should be provided to extend the weather service to every village that desired it on such conditions.

What is needed among all our people, and as much among farmers as other classes, is a more active patriotism and a more earnest spirit of co-operation. Instead of seeking the public crib for what one can get out of it, instead of going into politics for the money there is in it, we need to give our services more freely for what we consider to be the general welfare.

An Overlooked Item of Expense.

The wagon transportation of farm products is a greater item of expense than their transportation by other means. It costs more to carry products from the farm to the railway station, or steamboat landing, than their transportation costs thereafter. During the last census year American railways carried 636 million tons of freight an average distance of 108 miles at an average charge somewhat less than one cent for moving one ton one mile. In the same year over 53 million tons of freight were carried on the Great Lakes an average distance of 289 miles at an average charge of about one-tenth of a cent for moving one ton one mile.

There are no statistics of the distance agricultural products are conveyed by wagon, or the cost of such transportation. In some States farm products must be hauled by wagon 20 and even 30 miles, and even in Illinois, which has a greater railway mileage than any other State in the Union, there are three counties that have not a mile of railway within their borders. It has been calculated that wagon transportation costs at least 25 cents per ton per mile. Now 2,500 pounds is a good wagon load on an earth road in its best condition. To haul this load to the railway station, or steamboat landing, 15 miles distant and return, is a good day's work for a man and two horses, and nearly always the farmer making this trip returns with his wagon nearly, or quite, empty. Under such favorable conditions, transportation by wagon costs 10 to 15 cents per ton a mile. But oftener the dirt highway is in such condition that not more than 1,000 or 1,500 pounds can be hauled; not infrequently the wagon itself is all that the team can drag through the mud. Allowance being made for small loads when the condition of the dirt highway does not admit of full loads being hauled, and is it not plain that 25 cents per ton per mile is not too high an estimate of the average cost of wagon transportation? But it will certainly be safe to say that the average cost is only 15 cents per ton per mile, compared to about one cent by rail and one-tenth of a cent by water.

A very large part of our agricultural products, grains, as well as meats—perhaps more than one-half of our perishable vegetables, small fruits, poultry, and dairy products—is brought to the consumer solely by wagon. The larger part of the food consumption of man and beast in our villages, towns and smaller cities is brought by wagon, without the intervention of the railway, from the farm to the consumer. It would appear that of the farm products transported by horse power, scarcely one-half is transported by rail or water; while practically all farm products transported by steam or wind are transported by horse also. This being true, is it not true that wagon transportation of our farm products costs twice as much as the remainder of their transportation to the consumer?

The great magnitude and importance of wagon transportation is not generally comprehended. Farmers have not realized that to get farm products to railway or vessel costs more than all their after transportation, and hence are often indifferent to the means of wagon transportation, being content with miserable highways. Every effort has been made to promote railroads at the expense of wagon roads. And though economies will still further reduce freight rates by rail or water, how much greater is the margin for savings in wagon transportation by means of better roads. So long as wagon transportation costs twenty times as much as rail transportation, and seventy times as much as water transportation, the first named offers the most promising field for economy. Farmers have only to closely consider these and other points involved to find an affirmative answer to the question, Will good roads pay?

Another aspect of the case is ably treated in the Contra Costa system of naming and numbering country roads, a description of which is so prominent a feature of the current number of this magazine. Indeed, we regard the adoption of this system of naming roads and numbering them a most important step towards securing better roads. The Contra Costa system causes residents to take more pride in their location, and thus indirectly but none the less forcibly stimulates them to keep the roadway in good repair. This means a constantly heightening standard of road management. The beauty of the Contra Costa system is that it can be put into operation everywhere with practically no expense, thus paving the way for better roads in an economical, but none the less effective manner. The farmer is the last man in the country who should object to the naming, numbering and permanent improvement of country roads, although we admit that the fairest method of dividing the expense of building and maintaining such roads is an open question.

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ANIMAL AILMENTS.

Diphtheria in Animals.—It is a matter of undoubted evidence that cats contract diphtheria from human beings, and that children and other persons take the disease from cats. A certain form of diphtheria attacks cattle and proves both infectious and contagious, not only to their own species, but also to man, and in like manner the human disease may be conveyed to cattle. In a near neighborhood diphtheria was only broken up by a wholesale destruction of the pet cats.

Paralysis of Leg of Mare From Punctured Wound.—J. B. Williams, Monroe Co., Pa., has a very valuable mare that over a year ago, in the pasture, received a punctured wound in the off fore leg causing paralysis, and ultimately contraction of the tendons and foot. The case is of so long standing that relief only can be effected, and that even may be doubtful. The ablest veterinary surgeon within reach should be consulted, yet he might exert his skill to but little purpose on such an unpromising case. We advise putting the mare to breeding in any event.

Sprained Ankle, Swollen and Hard.—John E. Grah, Lawrence Co., Mo., has a work horse that was injured five months ago. The fetlock joints are swollen and hard. The persistent application of liniments has failed to reduce the swelling. Try biniodide of mercury ointment, rubbing the swollen part thoroughly once or twice a week. If not remedied, blister with cantharides ointment. Old chronic swellings on the legs of horses are as obstinate as bunions on human beings, which are seldom cured.

Delicate Calf.—A. G. Todd, Cook Co., Ill., has a heifer calf, the first of a pet heifer. It had diarrhœa badly, and since the milk and flax-seed meal has been discontinued it remains feeble. It is very small, but, being a Jersey, it was desirable to raise it. In being tied out the slightest pull at the rope throws it down, it is so weak. Such calves, if raised and bred, perpetuate debility of constitution and worthlessness. Delicate calves soon ruin a dairy herd. They are hardly worth feeding for the butcher. These are the animals that come out in the spring poor as crows, and require more care and trouble than they ever pay for.

Lampas.—Mrs. Wears, Clermont Co., O., has a pet horse which does not swallow hay or grass but takes it into the mouth, and, without chewing it, lets it drop. If the horse is old, there may be ulcers or inflammation of the mouth. Lampas is an inflammation of the bones of the mouth from dentition in young horses. Old horses sometimes have the edges of the teeth ground so sharp as to cut the lips. These the blacksmith can rasp off in a few minutes. Old horses should be fed on ground feed, oats and corn ground together and mixed with wheat middlings. Finely cut hay steeped in a bran mash will often be eaten with relish, and digested. It is the general custom to see these most faithful old servants turned adrift, or sold for a song to some brute of a vender, who soon works and starves them to death. Such vandalism is too outrageous to be tolerated in Christian communities. Indifference to the sufferings of our poor old brute servants is the cropping out of the barbarism which civilization has not eradicated out of some men.

The Fall of the Year.—This season has always been connected in idea with attacks of sickness among animals, as well as persons. And this common impression is justified, for the food is a most important agency in the condition of all animals. The herbage is now hard and indigestible, the soil is filled with germs of decay, and the dryness of the season has its effect in the stocking of the ground with those organisms that go generally by the name of malaria. Among stock the various fevers that may be classified as forms of anthrax, as the fatal splenic fever, the Texan fever, black-leg and swine fever, are all due to contagion originating in unwholesome feeding, and they occur at this season of the year until the frost destroys the active germs, and affords relief until the next season arrives. The most effective cure is prevention, and this consists in good and healthful feeding, and avoiding whatever may lower the vital force of the animal. Cattle should not pasture on low marshy land, where just now the remnants of the coarse herbage may tempt the owner to economize, as he may think, but very wrongly. Sheep are to be given a little grain, and not suffered, by the pangs of hunger, to consume rough weeds, and pigs should be equally well guarded from stagnant ponds, where the muddy and pestilent water may be injurious. The change from grass to hay is to be made gradually, that the digestive organs may be accustomed to it. To feed half rotten fruit is a temptation, but it is not fit even for a hog. Sound food alone is healthful.

Eruptions on Neck and Legs of a Mare.—C. W. Walther, Fairfield Co., Conn., has a mare that has an eruption on the neck and legs every summer, which causes her to rub when tied. The irritation also causes her to rub her tail, removing the hair so that it looks bad. Deranged digestive organs is at the root of the trouble. An aloes ball twice a week until three or four have been given, and at night half an ounce of saltpeter given in a bran mash, will doubtless relieve the case. Horses having a fine nervous organization, thin skin and nervous temperament, are more liable to suffer from either internal or external irritation than phlegmatic animals. Gross feeders are more apt to suffer from eruptions than delicate feeders. In winter, whole flaxseed thrown into the feed at night, allays irritation, and makes the coat sleek.

What Ails the Cow?—A subscriber in Southern New Jersey writes us: "This spring I came here in the suburbs to enjoy a country home. I bought a fine looking Jersey cow, gave her good feed, and turned her in a little patch of nice pasture. She seems well, gives a good lot of rich milk, but when lying down at night she breathes heavy and seems to have a swollen belly. She frequently takes a deep breath, and has a rattling in her stomach like fluid. I never had anything to do with cows, so do not know much about them. Her breath has a queer smell. Is the milk good?" Though the description of the complaint is not fully professional, yet it is sufficiently clear for diagnostic purposes. The cow is in perfect health, robust, plethoric, lusty. She may be a little pampered, but none of these conditions affect in any injurious way either the milk or butter. If more of our dairy cows had the same complaint, butter and milk would be better and cheaper. At the same time of day scrutinize your neighbors' cows and you will find the same or similar symptoms of vigorous health.

Foreign Dogs Liable to Disease.—A St. Bernard dog of middle age, having been ailing a long time, was sent to a veterinary hospital for canker of the ear. After a prolonged treatment, the dog died from paralysis of the heart. The post mortem revealed one cavity of the heart nearly filled with small worms, and the other cavity to have a well-organized flesh clot. These dogs do not live long away from their cold and stormy mountain homes. The Mastiff is also liable to cancer and other malignant diseases. But it is probable that these ailments have been transmitted by diseased ancestors. The Greyhounds to be used for hunting on high mountains must be bred for a time in these lofty altitudes, because the rarified atmosphere of the high mountains makes them so short of breath that they cannot put forth the speed of their ancestors in the lowlands.

Lump in Udder of Cow.—M. S. Marven, N. B., Canada, has a fine cow that calved in July. She had a heavily-stocked udder, and it left a lump just forward of one of the hind teats. It may possibly be removed by painting it with tincture of iodine every evening, after milking, for a week. The induration is the result of the inflammation of a gland. Early hand rubbing towards the end of the teat will remove these swellings. Garget, if entirely relieved, only leaves a future tendency to the trouble, but repeated attacks are apt to impair a portion of the udder.

Diseases Incident to Calving.—Milk fever, garget and retention of the membranes are common diseases in dairies. All are preventable. Every dairy or farm should have a hospital for the use of animals, at the time of parturition, for quietness and easy attention go a great way to ensure safety from all the accidents of this condition. A mare should have a roomy box stall provided for the occasion, and the cows a similar provision in a separate building to which they may be removed when the time for it is about to occur. To accustom the animal to the change, it should be made a few days previously. The less interference the better, but it is well for the usual attendant, to make frequent quiet visits, to see that things are going on rightly. This provision is not only desirable for the animal itself, but for others that may be disturbed by the trouble of their companion. This convenience provided in a dairy, where there had been cases of abortion previously, at once stopped this trouble, and it stayed stopped. The sheep should also have the same convenience provided, and there would be fewer losses of twin lambs, or cases of ewes disowning lambs. If this should occur the ewe may be most easily managed in the separate pen.

Irritable and Torpid Kidneys.—H. Buckers, Union Co., Oregon, has a nine-year-old horse which urinates with some difficulty. He has been so ever since he owned him, three years. He is not foul, eats well, works willingly, and keeps in good condition. When first led out in the morning, he straddles his hind legs and lifts one or the other high with a short rest. The horse has evidently been strained across the loins, causing an irritable and torpid condition of the kidneys. Give the following mixture in the feed at night: Whole flaxseed one ounce, powdered gentian two ounces, powdered niter (nitrate of potash) two ounces. Should this not fully relieve him, paint the loins once a week thoroughly, each side of the spine with tincture of iodine, and give a bran mash at night. It is a good plan to omit medicines once in a week for two days. Green food, grass, or roots, once a day will be of service.

Contagious Diseases.—Most of the worst diseases of farm animals are contagious. It goes without saying that this class of disease calls for immediate attention. Doubtless poultry are the most frequent sufferers, and more losses occur among them, than among any other kind of farm stock. It is very rare that it is thought worth while to save a sick bird, but it is not the single bird that is involved, but the whole flock, when such a disease as roup or cholera enters it. Stamping out, is then the safest remedy; although valuable fowls are worth saving. To separate the sick from the well is the first thing to be done, and then to treat the whole—the sick to cure them, and the well to save them. Antiseptic washes which destroy the virus and heal the membranes are the most effective for roup; and abstinence from food and a solution of hyposulphite of soda in water, one teaspoonful three times a day, has been found most useful in cholera.

Disturbance of the Digestive Organs.—The most common source of disease is found in a disturbance of the digestive organs. An old and very successful physician once said that most people dug their graves with their teeth. This homely, if coarse truth, applies to animals most especially, because the science of feeding is not generally understood. Swine and poultry are most subject to this class of disease, and over-feeding, and unhealthful feeding, are most prevalent among them. Some farmers never have sick animals, others are always troubled with them. The reason is that the one is most careful in feeding clean wholesome food, and the others just let things go. The science of feeding and the nature of the alimentation of animals should be made a study, and then the feeding would be more healthful and profitable.

Pig-Eating Sow.—A. J. Collins, King Co., Wash., states that he has been greatly troubled with sows eating their pigs at farrowing time, and wishes to know if there is a remedy for the bad habit. This propensity is the result of a deranged state of the stomach and bowels, attended with some fever. Such sows are restless, excitable, and greatly annoyed at the presence of any one at farrowing. If a bran mash containing a teaspoonful of common salt, and the same dose of saltpeter, be given for an evening or two before pigging time, where there is no constipation, the evil may be avoided. For the relief of constipation, an ounce of Glauber's salts, given in the bran mash, or slop, at each meal, until the bowels become soluble, the same happy result may be expected. Young sows destroy their pigs often from apprehension that the pigs may be taken away, or injured. They become frantic, and trample them to death. The more the injured pigs squeal, the more furious the sows become. Too much bedding causes the death of many litters of pigs from the inability of the mother to see the half smothered pigs. Grass and light slops should be given to young sows in high flesh.

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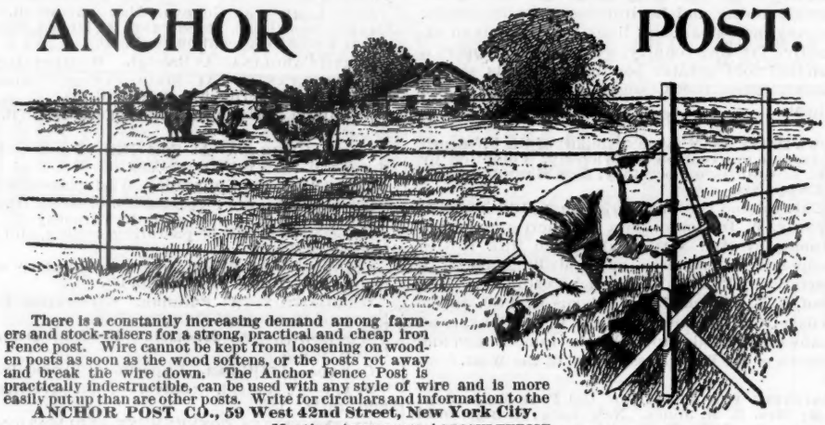

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FIVE HUNDRED QUESTIONS AND ANSWERS in Poultry Raising. With chapters on the Feed and Care of Poultry, Diseases, Eggs, Incubation, Buildings and Miscellaneous Queries on Turkeys, Geese and Ducks. Chatham, N. Y.: The Fancier's Review, 1891, 8 vo. Pamphlet.

This handy volume is a solid mine of information for the amateur breeder of poultry. This is a new, revised and enlarged edition, with an index added for ready reference. Several pages on new subjects are added in the chapter on diseases, and many remedies for the troublesome ailments are given by leading poultrymen. The questions are those which arise daily, and must be practically answered, if success is to be gained. Sold by Orange Judd Company. Price, postpaid, 25 cents.

AUTOBIOGRAPHY AND RECOLLECTIONS of Incidents connected with Horicultural Affairs, from 1807 to 1892. With Portrait and Allegorical Figures. By Louise Menaud. Albany: Weed, Parsons & Co., 1892. 200 pp., 16 mo., half Russia.

A Frenchman transplanted from Burgundy to New York, looks at America with eyes and thoughts which differ from the commonplace. Louis Menaud the famous horticulturist has written for us his life story with many a lively anecdote, crisp story, on shrewd epigram. Through all there is an intense love for flowers and fruits, and the reader is told many useful things about horticulture. The book is written in the conversational style, and gardeners, nurserymen and florists will find it very interesting, and the reminiscences will recall to the veterans many a contest for prizes in the flower shows.

PIGEON QUERIES: A Book for Pigeon Breeders and Fanciers. Questions and Answers on Numerous Topics pertaining to the Breeding and Care of the Pigeon, with Description of various Breeds. Edited by E. E. Quick. Chatham, N. Y.: Fancier's Review, 1892. 32 pp., il. 8 vo. paper.

The questions in this useful little volume were asked by pigeon fanciers who met these difficulties in actual practice. The answers are just the helpful hints which the amateur needs to lead him to success. As the author is the editior of the pigeon department of *The Fancier's Review*, the professional breeder will find this work an authority on the subject. Sold by Orange Judd Company. Price, postpaid, 25 cents.

CATTLE AND THE DAIRY. From the Farmer's Institute Question Box. A Book of Practical and Authentic Information on Various Topics Pertaining to Stock and Dairy Management as discussed at Farmer's Institutes, Dairy Conventions and in the Agricultural Press, with an Introduction by Hon. George T. Powell, Director of Institutes for the State of New York. Chatham: J. Wallace Darrow, 1892. 56 pp., 8 vo., paper.

In this small volume, subjects which will interest every dairyman and farmer are selected, and discussed in a practical manner. The replies to the questions are condensed, yet clear and easily understood. Sold by Orange Judd Co. Price, postpaid, 30 cents.

GARDEN DESIGN AND ARCHITECTS' GARDENS. Two reviews, illustrated, to show, by actual examples from British gardens, that clipping and aligning trees to make them "harmonize" with architecture is barbarous, needless, and inartistic. By W. Robins, F. L. S. London: John Murray. 1892. 73 pp., il., large 8vo., wide margins, cloth.

The author of this elegant volume believes that the one English thing which has touched the heart of the world is the English garden, and that a beautiful house in a fair landscape is the most delightful scene of the cultivated earth, and all the more so if it have an artistic garden. The protest of the book is that though formality is often essential in the plan of a flower garden near a house, it never is as regards the arrangements of its flowers and shrubs. Twenty-four page engravings of British home grounds illustrate the text. Sold by Orange Judd Co. Price, postpaid, $2.

ANNALS OF HORTICULTURE IN NORTH AMERICA FOR THE YEAR 1891. A Witness of Passing Events and a Record of Progress. By L. H. Bailey. New York: The Rural Publishing Co., 1892. 415 pp., il., 8vo., cloth.

The worker in garden and orchard can find no more useful volume than this. The vast horticultural literature of the year has been selected and digested for the reader, and much valuable matter from specialists has been collected and published for the first time. The whole field of fruits, vegetables, ornamental plants, plant diseases, insects, and national and educational interests has been surveyed. The horticultural periodicals of the world, the new plants, books, tools and conveniences are enumerated. A list of the botanic gardens of the world and directories of the societies and of the horticulturists in the experiment stations of North America are given. The most important feature of the volume is the census of cultivated native plants of this continent which is the first attempt to discover the extent to which horticulture is indebted to America. Sold by Orange Judd Co. Price, postpaid, $1.

VENEZUELA. A Handbook of the history, geography, industrial, commercial and political institutions of this South American Republic. Washington, D. C.: Bureau of the American Republics. 1892. 109 pp., il., 8vo., paper.

Venezuela is the most populous and civilized region in tropical America, yet the amount of population is not at all sufficient for the development of the agricultural resources of the 217,140 square miles of arable land between the Caribbean sea and plains of the Orinoca. The unsurpassed fertility of the soil, its products for domestic use and export, its necessary conditions of temperature, humidity and healthfulness, its increasing railways and steamboat lines, all render it an attractive farming country, which would support a hundred fold greater population, on its staple, cotton, coffee, cocoa, sugar, tobacco, corn and wheat.

IOWA DAIRY ASSOCIATION. Report of the Fifteenth Annual Convention at Waverly. Compiled by C. L. Gabrilson, Secretary, New Hampton. 1892. 128 pp., 8vo., cloth.

This volume contains articles on Milk Farmers by Gov. W. D. Hoard, Iowa Creameries and Iowa Women by Mrs. Nettie Fuller, The Milk Test in Coöperative Creameries by A. M. Bingham, Milk Bacteria by Prof. L. H. Pammel, Feeding Cows by Prof. G. E. Patrick, Dairy Schools by Prof. James Wilson, Corn Fodder by Prof. W. A. Henry, and many other good papers by the famous men and women of the Blue Grass Region of the West.

DAIRYING FOR PROFIT, or the Poor Man's Cow. By Mrs. E. M. Jones. New York: Orange Judd Company, 1892. 66 pp., ill., 8 vo., embossed gilt covers. Price 30 cents, postpaid.

The object of this book is to offer to hard-working, practical farmers, some suggestions by which they may increase their incomes, multiply their comforts, and better their positions. In no branch of farming is there such deplorable waste and shortsightedness as in dairying, the result of misapplied labor, going at work in the wrong way, toiling with methods that do not pay. Here are presented plans, facts and figures that will fear the closest scrutiny, showing how every owner of a cow in America can make much more and better butter, at a less cost for keeping, with less labor on the cattle and with the dairy utensils, and furthermore how to sell this butter for the fancy prices which only honest gilt-edged butter brings. The author is a practical dairywoman who began eighteen years ago with two cows and a small village field, selling a few pounds of butter to the neighbors, who appreciated its excellence, and so advertised its merits that seven thousand pounds are now annually sold from the little stony farm on the shores of the St. Lawrence river, near the Thousand Islands. Every difficulty which will meet the beginner is explained, and the way out is clearly shown. Every essential detail practiced by the professional dairyman is described and also adapted to small herds, and even to one-cow dairies. The volume tells how to choose a good cow; how to keep and feed her to the best advantage, and the most profitable ways of caring for and marketing her product. Here is a record of a life spent in dairying, a life marked by many mistakes and occasional failures, but these were corrected and surmounted, and success beyond expectation soon crowned the effort. Sold by the Orange Judd Co. Price, postpaid, 30 cents.

Recent Publications.

SOUTH AFRICAN AGRICULTURE, Cape of Good Hope. Report 1892. Secretary A. Fischer, Capetown.

RHODE ISLAND BOARD OF AGRICULTURE. Report 1892. Geo. A. Stockwell, Secretary, Providence.

INDIA AGRICULTURE IN MADRAS PRESIDENCY. Report 1891. P. Rajaratua Mudalin, Secretary, Madras.

MICHIGAN BOARD OF AGRICULTURE. Report 1891. Henry G. Reynolds, Secretary, Agricultural College, Mich.

THE AGRICULTURAL SITUATION IN GREAT BRITAIN. Read before the British Association at Edinburgh, August, 1892. Edinburgh: Oliver and Boyd.

AUSTRALIAN AGRICULTURAL LITERATURE FOR 1891. Edward Greville, Sydney.

AUSTRALIAN AGRICULTURE YEAR BOOK. 1892. Edward Greville, Editor, Sydney.

AGRICULTURAL EXPERIMENT STATION BULLETINS.

ARKANSAS—At Fayetteville. Report 1892.

FLORIDA—At Lake City. Orange analysis. Horn fly. Diseases of stock (B. 17).

GEORGIA—At Experiment. Report 1889.

INDIANA—At LaFayette. Wheat culture; Nitrogenous fertilizers for wheat (B. 41). Commercial fertilizers (S. B).

IOWA—At Ames. Feeding sheep. Sweet and sour cream. Insects (B. 18).

KENTUCKY—At Lexington. Fertilizers (B. 41).

MARYLAND — At College Park. Wheat insects (B. 16). Government direction of agriculture in Europe (S. B. H).

MASSACHUSETTS—At Amherst. Weather (H. B. 43m).

MICHIGAN—At Agricultural College. Fertilizers (B. 86). Report 1891.

MISSISSIPPI—At Agricultural College. Cabbage insects, Milk tests. Foods for milk and butter (B. 21).

NEW YORK — At Geneva. May cheese (B. 43). Strawberries (B. 44). Report 1891, At Ithaca. Steam or hot water for greenhouses (B. 41).

NORTH CAROLINA—At Raleigh. Weather (B.86c).

PENNSYLVANIA — At State College. Animal foods. Corn experiments. Silage (R. 91).

RHODE ISLAND—At Kingston. Fertilizers (B. 17). Report 1891.

SOUTH CAROLINA—At Fort Hill. Sweet potato storage (B. 5). Fertilizers (B. 6).

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CANADA—At Ottawa. Experiment farms. 1891.

SPAIN—At Madrid. Analysis of soils, fertilizers, and fruits. 1891.

UNITED STATES GOVERNMENT PUBLICATIONS.

DEPARTMENT OF AGRICULTURE, WASHINGTON, D. C.—Foreign crops; Freight rates (S. R). Growing crops (S. R. 98). Insect life (11 and 12 iv). Relations of soil to climate (W. B. B. 3). Physical properties of soils in their relation to moisture and crop distribution (W. B. B. 4). Instructions for special river observers. Instructions to operators on the U. S. sea-coast telegraph lines. List of U. S. experiment station bulletins to 1892: Experiment station record (12 iv).

CATALOGUES ACKNOWLEDGED.

CHICAGO VETERINARY COLLEGE: Catalogue of the session 1892-'93, giving a prospectus of the college year, and showing the prosperous condition of this excellent institution.

JOHN P. LOVELL ARMS CO., Boston, Mass.: Catalogue and price-list of the Lovell Diamond Cycles, giving descriptions and excellent illustrations of the various machines manufactured by this company.

GEO. RUEDY, Colfax, Wash.: Circular and price-list of the Palouse Apple.

VICTOR SCHMELZ, Sylvan Lake, Fla.: Trade price-list of palms, plants, bulbs, mosses, etc. native to Florida.

STORRS & HARRISON CO., Painesville, Ohio: Illustrated and descriptive catalogue of ornamental trees, shrubs, bulbs, etc. Several of the leading specialties are handsomely depicted on colored plates. Also a special catalogue of bulbs, roses, fruit trees, plants, etc., etc.

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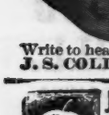

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Price Free by Mail: Dry Bulbs, 25c. each; 5 for $1.00.

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Ten-Block Road and House Numbers

IN CONTRA COSTA COUNTY, CALIFORNIA.

So important is it that the model "Ten-Block" system of naming and numbering country roads be universally adopted, that the AMERICAN AGRICULTURIST supplements the excellent article on Page 589 of this number with the following details. This data covers the whole matter, and will enable every county to put the plan in practice. Farmers' organizations, or public-spirited and progressive individuals, should take up this cause without delay.

An ordinance of the Board of Supervisors of the County of Contra Costa, State of California: Naming the several public highways of the county, and authorizing the use of certain other names and designations for private or local roads in use in said county; also providing for the erection and due preservation of suitable guide boards at all road crossings and intersections, and at other necessary or suitable points, upon such roads as have been properly measured and divided into blocks, according to the "Ten-Block System"; also providing for the affixing and maintaining by residents of house or farm entrance numbers, based thereon for all country residences upon such measured roads; also providing for an official road map of the county, and other records.

The Board of Supervisors of the County of Contra Costa do ordain as follows:

SECTION 1. All public highways which have been duly accepted by the county shall hereafter be known and designated by the names prescribed in this ordinance, according to the designation and descriptions laid down in Section 29.

SEC. 2. All private or local roads designated in Section 29 of this ordinance shall, in all official reference thereto, be hereafter known by the names herein prescribed; and the public use and recognition of such designations is hereby recommended.

SEC. 3. Whenever the owner or owners of any strip or strips of land within the county shall represent to the Board of Supervisors their purpose and wish to devote the same to use as a public or private road, or as a right of way for access to any dwelling, and shall offer or accept a name for the same, approved by the road committee, to be appointed or confirmed by the Board of Supervisors, and shall comply with the provisions of the law respecting roads, such road name, shall, when approved by the Board of Supervisors, be thereafter used in all official reference to the same, and its public use shall be recommended. Such road shall then be listed in the road list and given a designating number and letter, immediately following the number of the road to which it is adjacent or tributary, until such time as the Board of Supervisors shall revise the list and renumber the roads. And such road shall thereafter come under the provisions of this ordinance the same as the roads herein enumerated.

SEC. 4. The streets of all unincorporated towns or villages in the county may come within the provisions of this ordinance and be named. When numbered, the numbers to be according to the town method of 100 numbers to the actual block or square.

SEC. 5. The authorities of the village, town, or city incorporations in the county are recommended and urged to name the streets within their corporate limits, and to cause the houses thereon to be numbered; also to make use of one of the following designations only for the roadways, within such incorporation, viz.: Alley, Avenue, Boulevard, Court, Park, Place, Plaza, Promenade, Row, Square, Street, Terrace.

SEC. 6. Road measuring and numbering as contemplated by this ordinance are hereby defined and described as follows: All roads shall be measured along the surface line of the same, as near to the middle of the roadway as practicable, and laid off in imaginary blocks one-tenth of a mile, or 528 feet frontage each, according to the "Ten-Block System of numbering country houses." A line to indicate the division between these blocks, with the block number on either side of the same, shall be marked or painted upon the fence where practicable, and where it exists in a fair state of preservation, or upon any other permanent object on one or both sides of the road. The odd numbers shall be applied to the blocks on the left-hand side of the road, and the even numbers to the right-hand side. The block numbers shall be in figures not less than two inches nor more than two and one-half inches in height, where the fence board or other object will admit of this size, and so plainly painted as to be easily read from the center of the road. The mile distances shall be distinguished in some suitable manner, as by a full circle, and the half mile by a half circle or other suitable device.

SEC. 7. The initial point of measuring for roads leading from the county seat shall be the center of the street immediately in front of the main entrance to the court house at Martinez. Other roads shall be measured commencing at the end nearest the county seat, and branch roads the same, or from the main road to which they are tributary.

SEC. 8. Note shall also be taken and a record kept of the block within which is located, and the number of feet in or within the block (*i. e.* the distance from the commencement of the block), of all bridges, large culverts, important permanent springs, drinking troughs, public monuments, summits, road crossings, and intersections, and objects of special prominence, and the correct block number be marked thereon or near thereto where practicable.

SEC. 9. Note shall also be made and a record be kept of the number of the block within which is located, and a number of feet in or within the block of each and every house entrance, or gateway, lane, or road leading from the highway to any residence upon the roads, or to which access is had by way of the road with the name or names of the owner or occupant, when practicable to procure them; also to the entrance to all school houses, churches, and public buildings.

SEC. 10. The measurement of all roads which pass through or enter the corporate limits of cities or towns, shall be continuous, regardless of such boundaries, but the block and country house numbers may be omitted within such corporations.

SEC. 11. In the measurement of the roads of the county required by this ordinance, a record shall be made and preserved of the general course of bearings by the compass of all roads at road crossings or intersections. Also the general course of all private or local roads at their point of departure from the main road. And it shall be the duty of the county surveyor to prepare and place on file, in the office of the clerk of the county, a complete road map of the county, with the names of all roads, and whenever the same are measured the block numbers at their commencement, at all road crossings and at all crossings and connections of all roads, and at their endings, together with the boundaries of the several road districts in the county.

SEC. 12. The measurement of the roads of the county may include the record of the accurate reading by barometer of the altitudes or elevations above the sea level of the commencement and ending of all roads, all plains, valleys, the foot and summit of hills, and the slopes of mountains at suitable distances. The records of such altitudes, if taken, to be placed over the block number nearest the point of observation, or otherwise suitably posted, to show the range of important elevations traversed.

SEC. 13. Whenever one or more residents or owners upon any road enumerated in Section 29, or hereafter designated and described as required by this ordinance, or other person, shall furnish the Board of Supervisors satisfactory evidence that the provisions of this ordinance respecting road measuring and numbering have been faithfully complied with upon any road touching the county seat, or upon any road connecting with any other road which has been previously measured and blocked off, and whenever such residents shall file with the county clerk the record required in Sections 8, 9, and 11, and whenever such resident, residents, or other persons, shall have affixed block numbers at the beginning and ending of such road, and at each mile and half-mile division thereof, where practicable or oftener, then and in that case it shall be the

(*Continued to Page* 620.)

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Are compounded with the view to general usefulness and adaptability. They are composed of the purest vegetable aperients. Their delicate sugar-coating, which readily dissolves in the stomach, preserves their full medicinal value and makes them easy to take, either by old or young. For constipation, dyspepsia, biliousness, sick headache, and the common derangements of the *Stomach, Liver,* and *Bowels;* also, to check colds and fevers, Ayer's Pills

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Best Leg, Wood or Rubber Foot, $50.
Crutches, Elastic Hosiery, &c.
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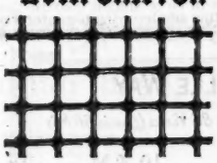
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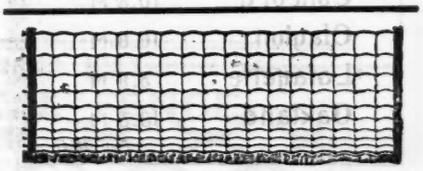

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"We point with pride" to the thousands of miles of our Coiled Spring Fence, made of steel and giving perfect satisfaction everywhere. Are you with us?
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CYCLONE CORN SHELLER
Will Shell a Bushel of Corn In 4 Minutes.

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Ask your Merchant for it. Send for circular and Price List 2.
BEST SHELLER IN THE WORLD.
Warranted FIVE YEARS.
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THE OHIO ENSILAGE AND FODDER CUTTERS AND CARRIERS
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ALL STEEL OR WOOD AND STEEL
WRITE FOR CATALOGUE
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Ten-Block Road and House Numbers.

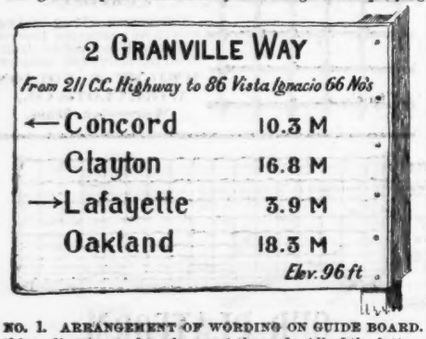
(*Continued from Page* 619.)

duty of the Board of Supervisors to erect upon such road, or roads, guide boards, as hereinafter prescribed.

SEC. 14. Whenever any such road is so measured and block numbers designated thereon, thenceforth and thereafter the several requirements of this ordinance as to the maintenance of house numbers, the protection and preservation of guide boards, etc., shall become applicable and in force along or upon such road or roads, and the penalties herein prescribed shall be duly enforced.

SEC. 15. The guide boards, when ordered upon any road, or roads, shall be erected and permanently maintained at the following named points and at such places as the Board of Supervisors may hereafter prescribe: At or near the commencement of all roads or branch roads, at all road crossings or intersections, at all ferry landings, at all railroad stations, and at all road crossings of the county boundary. They shall be so placed on the principal roads as to face the traveler when moving from the county seat.

SEC. 16. Such guide boards shall be of iron not less than No. 16 in thickness, galvanized and painted. They shall be bent at right angles to fit the post, and with two arms or boards for the lettering. The outer edges shall be bent back from the face one-half inch in width, the lower portion being cut away the width of the post, and the upper lip to rest on the top of the post, to which the board must be securely attached by a sufficient number of screws. The posts shall be of sound redwood, 6x6 inches, and 12 feet long, to be set three feet in the ground, with cross pieces nailed to the post, in light soils. The top and the portion below the ground to be dipped in or painted with coal tar, or some other wood preservative. The portion above the ground to be painted with two coats of good metallic or other suitable paint. The exposed surface of the boards shall be 15x24 inches in size, each, except at the entrance to local roads, which may have but a single projecting arm 6x15 inches in size, and affixed to a 4x4-inch post, in all other particulars to be of similar construction to the larger size. The wording and lettering to conform to the general plan indicated by the design accompanying this ordinance, and made a part thereof. All of the lettering upon the guide boards except the second line, which is in letters smaller than the others, and a section of 18 inches of the two faces of the guide post directly under the guide board shall be painted with luminous paint.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From 211 C.C. Highway to 86 Vista Ignacio 66 Nos
←Concord 10.3 M
Clayton 16.8 M
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Elev. 96 ft

NO. 1. ARRANGEMENT OF WORDING ON GUIDE BOARD.

SEC. 17. Upon all guide posts the following notice shall be conspicuously painted or stencilled:

A Penalty
For
Defacing
or
Posting.

SEC. 18. Whenever the provisions of Section 13 have been complied with as to any road or roads, and guide boards have been erected, the Supervisors shall also cause a printed notice to be served upon the occupants of every residence upon such road or roads outside the limits of incorporated towns, left at such residence, or, where the residence is distant a mile or more from the public or named road, mailed to their address, accompanied by a copy of this ordinance or abstract thereof. Such notice shall also be delivered or mailed to one of the officers of each school district and church of which the building is located upon said measured road. These notices shall have a blank form to be properly filled with the exact location and correct number of the entrance to the house, with instructions as to the house number to be posted and maintained.

SEC. 19. Every householder upon such measured road residing outside the limits of incorporated towns shall, within 30 days after the service of the notice required in Section 18, post, and thereafter permanently maintain, in legible condition, upon the road or at the entrance or right of way from the road, the correct house number of his residence, as given in said notice. It shall be placed in such a conspicuous position as to be easily seen and read from the center or opposite side of the road. The figures shall be well proportioned and of a size not less than three inches in height, nor more than four inches, except in town or village settlements, where the numbers may be one inch less in height, and may be maintained upon the doorway or at the gate. The numbers must be neatly made, in the style and manner that a professional sign writer would use.

SEC. 20. Any owner or occupant of any dwelling in the county which is reached by a private road or right of way

(*Continued on Page* 621.)

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Gold Dust WASHING POWDER

IS POWDERED SOAP AT BAR SOAP PRICES. It is sold by every enterprising grocer in wholesale packages (4 lbs.) for 25 CENTS.

N. K. FAIRBANK & CO., Sole Manufacturers,

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Samples and Full Particulars

FREE to you. Write for them.

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"What would?"

NEPONSET WATER PROOF FABRIC

Which would keep out the rain, snow, and cold completely; keep your hens warm; make them lay more eggs.

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YOU Need them for your Greenhouses, Hotbeds, Barns, Henhouses, Outbuildings and Dwelling Houses Inside and Out.

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Ten-Block Road and House Numbers.

(*Continued from Page* 620.)

is hereby permitted to post and maintain his house number upon the public highway at the entrance to such private road or right of way, or upon such private road or right of way, and he or she may place therewith his or her own name and business, provided such sign is made in a neat and tasteful manner and conforms to the provisions of this ordinance.

SEC. 21. Whenever the occupant of any dwelling upon a measured and numbered road shall fail for the term of 30 days to maintain the proper house number at the entrance thereto, and, having been notified by the road officer to comply with the law shall fail to do so, he shall be deemed guilty of a misdemeanor.

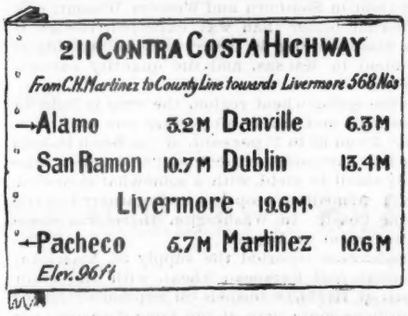
SEC. 22. Whenever any house upon a measured and numbered road now vacant shall be occupied, or any new dwelling house shall be erected upon such road, it shall be the duty of the occupant within 30 days to properly post and thereafter permanently maintain, at the entrance thereto, the correct house number of the same as provided in this ordinance, and such residence shall thereafter come under the provisions of this ordinance the same as dwellings now occupied.

Sec. 23. There shall be prepared for county use a Book of Records for the roads of the county, in which shall appear, arranged in proper order, under the name of each road, an index or digest of all ordinances or other official action relating to that road, making such road record an official history of all the roads of the county.

SEC. 24. A copy of all the field notes of the survey measurements, elevations, and other records, with the block and house numbers as provided for, shall be carefully preserved in the office of the county clerk, and open to the inspection of citizens, as are other county records.

SEC. 25. The execution of the work required by this ordinance shall be subject to the inspection, and be made to conform to the requirements of a road committee to serve without pay, and to consist of three members, one to be appointed by the Board of Supervisors, one to be named by the road-naming committee who have prepared this plan, and the third to be chosen by the two thus appointed, and all to be confirmed by the Board of Supervisors, and any work of measurement, erecting guide boards, or affixing numbers, shall not be held to be complete until approved by a majority of this committee.

SEC. 26. It shall be the duty of the road officials to thoroughly inspect the roads within their respective districts, and to make report to the Board of Supervisors at least as often as at the close of each six months of their terms of office, as to the condition of such roads, and any failure to comply with the provision of this ordinance. They shall also see that guide boards are preserved in a legible condition and house numbers properly maintained, notifying residents of any neglect in this respect. It shall be their duty to report any person charged with violating the provisions of this ordinance, and to enter complaint against them in such case. They shall also have full authority to


211 CONTRA COSTA HIGHWAY
From C.H. Martinez to County Line towards Livermore 568 Nos
Alamo 3.2M Danville 6.3M
San Ramon 10.7M Dublin 13.4M
Livermore 19.6M
Pacheco 6.7M Martinez 10.6M
Elev. 96 ft

NO. 2. GUIDE BOARD AT RIGHT ANGLES TO NO. 1.

arrest any person or persons found defacing or removing block or house numbers, or mutilating any guide board, or posting any notice upon the posts or boards, or in any way violating the provisions of this ordinance.

SEC. 27. If any person or persons shall mutilate, deface, destroy, or remove any guide board or guide post, any block or house number, any name, sign, or advertisement, which may be lawfully posted at or upon the entrance to the residence or dwelling of any person to whom such notice belongs, whether such entrance be public or private or through right of way, or shall mar, deface, or injure by shooting, stoning, or otherwise, any guide post or board, or shall fasten, or paint, or stencil any notice or advertisement to such posts or boards, save such as are required by this ordinance, the person or persons so offending shall be deemed guilty of a misdemeanor, punishable upon due conviction by fine of $50, one-half of which shall go to the informer, or by imprisonment, or both.

SEC. 28. The roads of the county, as enumerated in Section 29, are listed according to the following: Rule.—Commence on the east side of a line extending due north from the county seat, and work around in a circle to the east, south, west, and back again to the north, always facing outward and working from the county seat outward, and always from the left to the right. List first those roads touching the county seat; next the first left-hand branch roads and any left-hand branches of these. Continue with the right-hand branches. Follow with the remaining trunk roads and their branches; left-hand branches first, right-hand branches next, omitting nothing on the left until the entire circuit has been made and the roads of the county are all listed. Under this rule the roads leading from Martinez, five of them are first listed; then the first of the five which have branches, No. 2, and the list continued in the order explained above.

SEC. 29. The following are the names of the several public highways and private or local roads of the county respectively, hereby authorized and established. [List of 130 roads, among which are: Alpha Way from Martinez to Bull's Head; Contra Costa Highway from Martinez to county line via Pacheco, Walnut Creek, and San Ramon Valley; Alhambra Way from Martinez to Pinole; Granville Way from Contra Costa Highway near Walnut Creek to Vista Ignacio; Franklin Road; Teal Local; Tule Road; Pacheco Exit; Vine Hill way; Locust way; Plover Connex; Willow Pass Road; Fluna-veg (River Road); Black Diamond Way; Empire Road; Paso Corto; Camino Diablo; Carbon Way; Arbor Connex; Lone Tree Road; Almond Way; Summer Road; Dry Creek Local; Zig Zag Way; Sunol Local; Concord Lateral; Pomona Road; Ferndale Local; Golden Gate Way; Vaca Crescent; Verdel Circuit; Acorn Local; Highland Drive, and Forest Road.]

SEC. 30. This ordinance shall take effect and be in force on the 16th day after its passage.

Passed March 8, 1892.

The Tobacco Crop has been harvested free from frost, though its average condition Sept. 1st for the whole United States was returned by the Department of Agriculture at only 79.9, against 87.4 last year and 82.4 two years ago. The reduction in condition is most serious in the heavy leaf belt of the Southern States. The cigar leaf crops of New England and New York were never better, Pennsylvania's shows a serious falling off from last year, and the same is true of Ohio, but Wisconsin's crop is far better than last year, with 25,000 acres against 21,000 last season. Cigar leaf tobacco is having a great boom in Florida, where as high as $1.25 per pound has been offered for wrappers grown this year from seed of the Vuelta Abajo variety, obtained from Cuba two years ago. The supply of wrappers is very short, and in spite of the increased acreage in the Connecticut and Housatonic valleys, the current high prices of the new crop are likely to be more than sustained, according to the *New England Homestead* of Springfield, Mass., which is the great authority on this money crop. It reports sales of numerous crops at 20 to 36 cents per pound for the cured leaf delivered in the bundle, most of the sales being made at from 28 to 32 cents, whereas prior to 1890 the average price was only ten cents per pound. One Housatonic valley grower, who cased his 1891 crop of Havana seedleaf, has just sold it for 50 cts. per pound. This heavy advance in prices of domestic tobacco is due to the shortage in the world's supply of wrappers and the exclusion of Sumatran leaf by the higher tariff.

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THE AMERICAN AGRICULTURIST ANNUAL REVIEW AND ESTIMATE.

The Prospect in Round Millions:

	1892.	1891.	1890.	Ave. '80-89.
Corn, bushels...	1,712	2,060	1,500	1,703
Wheat, bu.....	500	612	400	468
Oats, bushels...	629	738	525	584
Cotton, bales...	6.5	9.1	8.9	6.5
Potatoes, bu....	150	235	124	†175
Hops, pounds...	34.4	39.7	36.9	*30.2

*Average potato crop of 1883-'89. †Hop Crop of 1889.

Good Prospects for Cotton.

The Department of Agriculture's September report shows a decline in condition for the month, and a lower one than in any September since 1883, the average being 76.8 as compared with 82.7 last year and 85.5 in 1890. This deterioration in condition is primarily due to the very heavy rainfall early in the season, followed later by drouth, which resulted in a shedding of forms and leaves, premature ripening and rotting of bolls. Delayed planting, slow germination and obstructed cultivation were the results of the season of excessive precipitation, making the crop universally late.

On the Gulf coast rainfall has been above the normal, except in Texas and Arkansas, and condition is consequently worst east of the Mississippi. In August, local drouths were injurious on portions of the Atlantic coast breadth, in some districts of Arkansas and in Texas. The natural result of such conditions is rust, which is quite generally reported in the districts of heavy and irregular rainfall. There has also been considerable complaint of depredations by insects. The boll worm has infested the Gulf coast region and was seen in Georgia, but not much in the more northern belt. The caterpillar was noted in Texas and at a few points in some other States, and there was some complaints of grasshoppers and of hemipterous insects, popularly known as sharpshooters. With this poor condition of the crop, September 1st, it is of interest to compare the acreage for 1892 as estimated by the AMERICAN AGRICULTURIST from preliminary census returns and as calculated from the more complete census by Secretary Hester of the New Orleans cotton exchange, together with Department returns of condition:

	Acreage, 1892.		Cond'n Sept. 1.		
	Am. Ag.	Hester.	'92	'91	'90
Virginia.....	29,085		75	78	93
North Carolina..	780,105	836,008	76	79	95
South Carolina..	1,366,218	1,650,927	77	81	87
Georgia.....	2,413,338	2,723,121	79	82	86
Florida.....	214,760	187,798	66	88	90
Alabama.....	2,340,947	2,271,634	72	83	84
Mississippi.....	2,139,171	2,374,170	72	83	87
Louisiana.....	796,310	927,238	76	85	93
Texas.....	3,908,577	3,685,483	81	82	77
Arkansas.....	1,108,279	1,325,335	79	86	89
Tennessee.....	695,042	587,572	79	84	94
United States.	15,791,852	16,636,985	76.8	82.7	85.5
In 1891.....	18,917,093	19,948,287			
Difference.....	3,125,241	3,311,302			

The average yield of lint per acre for the three previous years—226 lbs. last season, 211 in 1890 and 181 lbs. in 1889, if we accept Mr. Hester's deductions of acreage as correct—is 209 lbs. With September condition 10 per cent. below the average for the same period, the indicated yield is 188 lbs. this season, and the quality is not as good as usual. Such a yield on Mr. Hester's acreage would make a crop of 6,255,506 bales. If only five per cent. shrinkage in product is allowed for, and the yield is placed at 200 lbs. per acre, the indicated (Hester) crop is 6,654,794 bales, against 6,316,740 bales as indicated by the AGRICULTURIST acreage at 200 lbs. per acre, and 5,937,736 bales at 188 lbs. per acre. Is it possible that the '92 crop can exceed 6,500,000 bales? The crop, as commercially reported, was for 1891 the enormous total of 9,038,707 bales; in 1890, 8,655,518 bales; and in 1889, 7,313,726 bales.

Looking to the Future the indications certainly seem favorable for a much higher and more steady market. The exports of cotton, for the season ending August 31, 1892, were 5,865,000 bales, while the takings of spinners in this country amounted to as much as 2,894,000 bales, leaving a surplus on hand, September 1st., of 280,000 bales, only, out of the enormous crop of last year, plus 137,000 bales carried over from the previous season, making an aggregate of stocks on hand of 416,000 bales to begin the new crop year. Adding this to the 6,500,000 bales, estimated for this season's yield, and we have only a total of 6,916,000 bales to meet trade requirements till September 1, 1893.

The Consumption of Cotton.—In the matter of exports there has been an increase of only 75,000 bales, during the past crop year, over the previous year, notwithstanding the low prices that have ruled. There has been a considerable decline in the quantity taken by Great Britain, while other European countries have increased their takings. The English cotton market has been in a state of temporary collapse due to the silver situation, a large decrease in manufactures of cotton goods and some heavy failures in the trade. The consumption in Great Britain fell off last trade year by 150,000 bales, that on the European continent remained stationary, while in the United States it increased by 330,000 bales and in India by 145,000 bales. Here the consumption of our Southern mills increased by about 95,000 bales, and in our Northern mills by about 235,000 bales.

If we take our exports of cotton for the 1892-93 year at 5,865,000 bales, the same quantity as for the crop year just ended, we have only 1,051,000 bales left for home consumption, which amounted to 3,290,000 bales in 1891-92. At the beginning of last season, however, American spinners had some 400,000 bales on hand. Granting that this quantity has been increased to 500,000 bales on hand at the beginning of last month, owing to low prices which may have induced spinners to load up more heavily, we are yet confronted with an apparent shortage of 1,739,000 bales for the present trade year, as between our supply on the one hand, and our domestic exports and consumption of cotton on the other. It must be further remembered that American mills are doing an enormous business at the present time, and the indications are that their consumption of cotton will be larger than ever before in the history of the trade.

The AGRICULTURIST thinks it is safe to assume that American spinners will take an additional 10 per cent. in the present year, or a total of 3,190,000 bales. This would increase the apparent shortage to 2,029,000 bales. On the other hand it may be argued that our increased output of cotton goods may result in a still further decrease in the British manufactures. While the increased consumption of cotton has averaged 400,000 bales, annually, during the past 14 years, it was only 320,000 bales in the 1891-92 year. Taking it at the same rate for 1892-93, and we find that the estimated increase in the output of American mills would be 30,000 bales of the world's increased consumption. even if it be no larger than for the trade year just ended. Therefore, the apparent shortage may be increased to 2,059,000 bales.

The World's Supply.—Can the crops of other countries together with the stocks on hand make up this deficiency? The total visible and invisible supplies of cotton, at the beginning of the present trade year, are placed in round numbers at 3,000,000 bales. The total crops of other countries may be safely placed at not to exceed 4,000,000 bales, (last year they were 3,900,000 bales) and our own crop estimate is 6,500,000 bales. This gives total visible, invisible and new crop supplies of 13,500,000 bales for the whole world. Setting against this the actual figures of last year's consumption—Great Britain 4,080,000 bales, European continent 4,524,000, United States 3,290,000, India 1,200,000 bales, and we have the total world's 1892-93 consumption of 12,994,000 bales, to supply which there are 13,500,000 bales available, leaving an apparent surplus in the world's supply of 500,000 bales.

Higher Prices in Prospect.—This allows for no increase in consumption throughout the world, which has averaged 400,000 bales annually during the last fourteen years. With this same increase during the current year, the apparent surplus would be only 100,000 bales, a comparatively insignificant quantity to carry over at the beginning of a new trade year, and which would be promptly wiped out by any sudden demand. If the Department's statistics be approximately correct, and no change in the condition during September and October, there must be a very close call between supply and demand, and there is every assurance that the price of cotton will be higher and remain so.

A Shortage in Hops appears evident from an elaborate statistical crop report published in the *New York Homestead*, of Syracuse, N. Y. The indications are for a world's deficiency in supply of about 75,000 bales of 180 pounds each, less such stocks as may have been carried over from last year, and which are known to be exceedingly small. The New York crop is placed at 100,000 bales, as compared with 121,000 in 1891, and the total Pacific coast at 86,000 bales, as against 94,000 last year. Washington hop yards have suffered from lice, and many will not be picked at all, while the New York and California crops appear to be of excellent quality. England and Germany have short crops.

The Wheat Crop as Harvested.

The September average of condition of winter and spring wheat, as harvested, is 85.3, against 86.9 at the same time one year ago, and 75.5 on September 1, 1890. The August average for spring wheat was 87.3, and the July condition of winter wheat was 89.6. The average decline since previous reports, therefore, exceeds three points. In the preceding ten years condition was lower in 1883, 1885, 1887, 1888 and 1890. The average September condition for the past ten years is just 86, so that the 1892 crop may be reckoned as a fair average yield. It will probably make 12½ bushels per acre the national average, compared with 15½ on the extraordinary harvest of last year, 11 bushels in the short crop of 1890, and 12.1 bushels as the average for 1880-9. This points to a total product slightly less than 500,000,000 bushels on 39,467,000 acres.

In the Middle States quality is medium. Rust is reported to some extent. In the South the berry was generally very plump and sound when harvested, but has been damaged somewhat by prevalent rains.

The yield of Illinois wheat has generally met the expectation, and is good in Southern Indiana, but disappointing in some districts of that State and Ohio. The forcing weather of June produced a large growth of straw in Michigan, while, later, conditions resulted in a small and shrunken berry. The yield in Southern and Western Missouri was somewhat better than was expected, though it was disappointing in other sections. Quality is excellent in Kansas, and the quantity exceeds expectations.

In the spring wheat region, the crop is light in Wisconsin, and barely an average one in Minnesota. From 65 to 75 per cent. of the South Dakota crop was harvested on the first of September, relatively small in yield, with a somewhat shriveled berry. A medium crop has been garnered on the Pacific Coast. In Washington there was some improvement in August.

Bradstreets reported the supply of American, Canadian and European wheat, with the grain afloat, at 111,014,000 bushels on September 1st, or 24 millions more than at the same date one year ago, 41 millions more than on September 1, 1890, and 37,000,000 bushels more than the world's visible supply on September 1, 1889. This, however, will not, by any means, make up for the 100,000,000 or more bushels that the United States crop is less than last year, so that prices ought to gain strength. Exports continue liberal, having been 13,720,000 bushels (including flour as wheat) in July, or almost exactly the same as in July last year, against 4,814,000 bushels in July, 1890. The commercial reports make the wheat exports from our 12 leading ports, for the period from July 1st to September 8th, a little over 33 million bushels, compared to 41 millions in 1891, and 21, 20 and 23 million bushels in the like periods of the three preceding years.

The Corn Crop of 1892.

Its Condition September 1st.—The Statistician of the Department of Agriculture reports a decline in the September condition of corn to 79.5, from 82.5 in August. The change is slight in the surplus corn States, except in Kansas. Present condition is 79 in Ohio, 75 in Indiana, 70 in Illinois, 78 in Iowa, 82 in Missouri, 70 in Kansas and 76 in Nebraska. In other States the average of condition is everywhere higher than the National average, except in Michigan and Wisconsin. In comparison with September reports of the past ten years only three were lower—70.1 in 1890, 72.3 in 1887, 76.6 in 1886. The present figures are between five and six points below the average of ten previous years.

In the Eastern and Southern States.—The crop is well grown and maturing rapidly without frost as yet in the Eastern States. In the Middle States drouth has injured corn, especially in New Jersey and Pennsylvania, reducing condition five points

(*Continued on Page* 624.)

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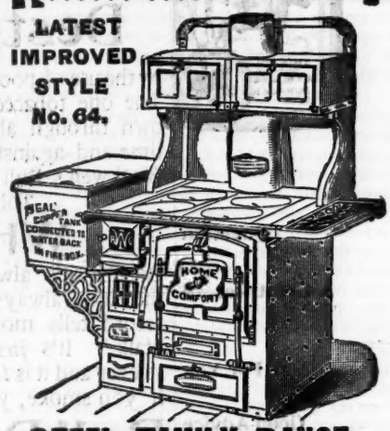

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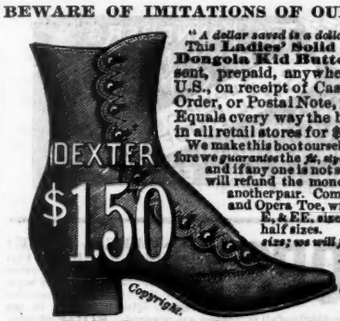

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THE CROPS OF THE YEAR.

(*Continued from Page 622.*)

in each, while in New York it is only depressed from 80 to 79. In Delaware late planted corn has been injured. In Maryland and Virginia drouth also caused a serious reduction, while from South Carolina around to Texas high condition is well maintained, no figures falling to 90 except those of Florida and Mississippi. Rains in most of this region have interfered with cultivation, and in some districts rotting of the ears is reported. In Texas and Arkansas good yields are assured, and a fair crop is made in Tennessee.

The Central and Western States.—Corn has improved in central Ohio and declined from drouth in the southern counties. Decided improvement is reported in Indiana. There has been injury from drouth in Michigan, Illinois, and Kansas, and in less degree in Missouri and Iowa. The crop is late throughout the Northwest. No injury from frost is reported up to September 5th.

The Area and Crop.—The weather up to September 15th has been practically free from frost, and the crop, though late in many sections, is in better shape than seemed possible a month ago. Even with the most favorable weather, however, much corn is so late that the proportion of sound and merchantable corn will be considerably less than usual. As was so fully shown in the AMERICAN AGRICULTURIST for September, acreage under corn increased in the 11 cotton States, where we place it at 26,581,000 acres, or nearly two millions more than last season. The yield will not average over 15 bushels per acre in these States this season, against 16.8 bushels last year. Hence the cotton States will have 398,715,000 bushels in 1892, compared to 412,378,000 bushels last year, a decrease of 13,663,000 bushels. Here follows a

COMPARISON OF THE CORN SURPLUS STATES.

	Ohio.	*Ind.*	*Ill.*	*Ia.*	*Mo.*	*Ks.*	*Neb.*
Condi'n Sep.1,'91.	95	90	88	90	88	82	89
" '92.	79	75	70	78	82	70	76
Yield p'r acre, '91.	33.7	32	31.2	36.7	29.9	26.7	36.3
" ind.'92	28.3	27.2	25.6	32.3	28.1	23.5	31.6
Acr. millions '91	2.9	3.7	7.0	9.6	6.8	5.3	4.8
" '92	2.6	3.1	5.9	8.3	5.8	5.2	4.6
Bushels, mil's, '91	94.1	103.6	234.9	350.9	203.2	141.9	167.7
" '92	74.8	84.8	150.8	268.7	164.2	123.6	145.9

In other sections the area under corn has been reported as just about the same as last year—about 11,500,000 acres, while the September condition indicates a product in these States fully 12 per cent. less than in 1892. The outlook for the total crop (irrespective of quality or proportion merchantable) may therefore be roughly summarized as follows:

THE TOTAL CROP IN BUSHELS.

	1891.	1892.	*Decrease.*
Cotton States.....	412,378,000	398,715,000	13,663,000
Surplus States...	1,296,227,000	1,012,957,000	283,269,500
Other States.....	341,649,000	300,651,000	40,918,000
Total,.....	2,060,154,000	1,712,323,000	347,930,500

This confirms our September prediction of a crop of about the average for the twelve preceding years, grown on about 73,600,000 acres, or some three million acres less than last year. If the '91 corn still on hand no more than offsets the extra amount of poor grain in the present crop, the prospect is bright for fair prices for our corn crop.

Small Grains.—The condition of rye on September 1st, for the whole United States averaged 88.5 against 95.1 at the same date last year, and 85.4 at this date in the short crop year of 1890. This report confirms the prediction in our September issue that the new light crop would move off at fair prices. Barley makes an average condition of 87.4 against 94 a year ago and 79 in September two years back. The increased breadth will probably make the total crop as large as last year; imports of barley in the seven months ended July 31st were 894,000 bushels against 942,000 in same time last year, and 5,256,000 bushels in the first seven months of 1890 prior to the passage of the higher tariff. Buckwheat fell off four points during August, its September condition being reported at 89, or just about its condition at the same date two years ago, compared to 96 in September of 1891; the crop therefore will not be over large.

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MATTERS OF BUSINESS.

Further Reports of the Cereal Census.

Another exhibit of the changes in the production of cereals during the ninth decade is now possible. The table below shows the acreage and yield of our leading grain crops, according to the census of 1879, compared with the same facts for 1889 as revealed by the eleventh census. This should be studied in connection with a similar review for other States, and a more extended criticism in the AMERICAN AGRICULTURIST for June last, Page 390. To this is added a briefer summary of equally significant facts about the grain crops of the Inter-mountain States.

The Census in other States.—Idaho had 98,175 acres in cereals compared to 44,777 ten years earlier, the yields being 2,037,000 and 1,298,000 bushels respectively. Wyoming had only a thousand acres in grain in 1879, which, ten years later had increased to 20,342 acres,—wheat 4,528, oats 13,223, corn 1,976 acres.

Nevada's cereal production has shrunk one-half, her 15,530 acres making 424,846 bushels in 1889, against 783,000 bushels in 1879.

Utah's development in grain growing is also somewhat disappointing, her acreage being only 122,878 compared to 116,495 in 1875, while the eleventh census makes the crop 2,396,000 bushels, or only 418,000 bushels increase over the tenth census. Utah had 84,505 acres under wheat, an increase of about 12,000. Arizona had only 22,700 acres of grain in the last census year, or 603 less than ten years ago; wheat 6,225 acres in 1889, and over 9,000 acres ten years earlier, but corn increased from 1,808 acres to 4,330. The falling off in New Mexico is still more marked, her cereal acreage being only 61,340, according to the eleventh census compared to 104,480 acres in 1879; then she had 51,000 acres of wheat against 21,800 in 1889; corn 41,450, then, against 28,540 acres, while oats remain at about 9,000 acres.

Florida reveals 42,000 acres of oats, a decrease of 6,000, and 379,000 acres of corn, or 18,600 more than in the previous census. In old Delaware, changes in grain growing have been slight during the ten years; corn in 1889 was grown on 175,000 against 202,000 acres ten years before; oats 19,000, a decrease of 2,000 acres; wheat 94,368 compared with 87,540; buckwheat a little over 300 acres, and twice as much rye, or about the same as before, making a total of 289,650 acres of cereals against 308,000 in the tenth census, and a total crop of practically 5,000,000 bushels—a falling off of 460,000 bushels.

West Virginia likewise reveals but small change in its cereal crops during the decade; then 30,000 acres of buckwheat, now 14,000; corn 593,000, an increase of 27,000 acres; oats increased over 50,000 and were grown in 1889 on 181,000 acres; rye 15,000, a falling off of 2,317 acres; wheat 349,016 acres per the new census, or 44,052 less than a decade earlier; total cereals, 1,151,600 acres, an increase of 17,057. The total production of cereal in the last census year was 20,554,000 bushels, or but 145,000 bushels more than the 1879 crop.

THE CENSUS OF CERRAL CROPS.

	Acres. 1889.	Acres. 1879.	Acres. Dif.	Bushels. 1889.	Bushels. 1879.	Bushels. Dif.
WISCONSIN.						
Barley	474,914	204,335	+270,579	15,225,182	5,043,118	+10,182,754
Buckwheat	77,458	34,117	+43,341	1,064,178	299,107	+765,071
Corn	1,120,341	1,015,393	+104,948	34,024,216	34,230,579	−206,363
Oats	1,626,751	955,597	+671,154	60,753,152	32,905,320	+27,847,832
Rye	275,058	139,692	+105,366	4,250,582	2,298,513	+1,952,069
Wheat	744,080	1,948,160	−1,204,080	11,698,922	24,884,689	−13,185,767
Total cereals	4,318,602	4,327,294	−8,692	127,116,922	99,661,326	+27,355,596
MICHIGAN.						
Barley	99,305	54,506	+44,799	2,522,376	1,204,316	+1,318,060
Buckwheat	70,057	33,948	+36,109	812,412	413,062	+399,350
Corn	994,588	919,656	+74,932	30,578,015	32,461,452	−1,883,437
Oats	1,085,759	536,187	+549,572	36,961,193	18,190,793	+18,770,400
Rye	140,752	22,815	+117,937	2,101,713	294,918	+1,806,795
Wheat	1,501,225	1,822,749	−321,524	24,771,171	35,532,543	−10,761,372
Total cereals	3,891,686	3,389,861	+501,825	97,746,880	88,097,084	+9,649,796
MINNESOTA.						
Barley	358,510	116,020	+242,490	9,100,683	2,972,965	+6,127,718
Buckwheat	22,090	3,677	+18,413	281,705	41,756	+239,949
Corn	901,690	438,737	+462,953	24,696,446	14,831,741	+9,864,705
Oats	1,579,258	617,469	+961,786	49,958,791	23,382,158	+26,576,633
Rye	62,869	13,614	+49,255	1,252,663	215,245	+1,037,418
Wheat	3,372,627	3,044,670	+327,957	52,300,247	34,601,030	+17,699,217
Total cereals	6,297,044	4,234,187	+2,062,857	137,590,535	76,044,895	+61,545,640
DAKOTAS.						
Barley	206,663	16,156	+190,507	2,467,922	277,424	+2,192,498
Buckwheat	1,708	321	+1,387	12,362	2,521	+9,841
Corn	705,316	90,852	+664,464	13,341,147	2,000,864	+11,340,283
Oats	982,954	78,226	+904,708	13,236,415	2,217,132	+11,019,283
Rye	10,797	2,385	+8,412	77,378	24,359	+53,019
Wheat	4,967,010	265,298	+4,701,712	42,918,583	2,830,289	+40,088,294
Total cereals	6,934,448	453,238	+6,481,210	72,055,807	7,352,589	+64,703,218
OHIO.						
Barley	37,092	57,482	−20,390	1,039,915	1,707,129	−647,214
Buckwheat	14,106	22,130	−8,024	166,139	280,229	−114,090
Corn	3,189,684	3,281,923	−92,239	115,539,164	111,877,124	+3,662,040
Oats	1,215,324	910,388	+304,936	40,136,034	28,664,505	+11,471,529
Rye	59,643	29,499	+30,144	1,007,156	389,221	+617,935
Wheat	2,269,585	2,556,134	−286,549	35,559,208	46,014,869	−10,455,661
Total cereals	6,785,434	6,857,755	−72,122	193,467,616	188,933,077	+4,534,539
MISSOURI.						
Barley	1,504	6,472	−4,968	34,863	123,031	−88,168
Buckwheat	2,819	5,463	−480,960	29,435	57,640	−28,205
Corn	6,069,225	5,588,265	+480,960	197,133,132	202,414,413	−5,281,281
Oats	1,677,068	968,473	+708,595	39,814,257	20,670,958	+19,143,299
Rye	24,258	46,484	−22,226	308,807	535,426	−226,619
Wheat	1,947,365	2,074,394	−127,029	30,113 991	24,966,627	+5,047,364
Total cereals	9,722,239	8,689,551	+1,032,688	267,434,485	248,768,095	+18,666,390
ARKANSAS.						
Barley	106	157	−51	994	1,952	−958
Buckwheat	388	92	+296	5,074	548	+4,526
Corn	1,648,443	1,298,310	+350,133	33,982,318	24,156,417	+9,825,901
Oats	2,88,332	166,513	+121,819	4.180,877	2,219,822	+1,961,055
Rye	2,470	3,290	−820	15,181	22,387	−7,206
Wheat	140,464	204,084	−63,620	955,668	1,269,715	−314,047
Total cereals	2,080,203	1,672,446	+407,757	39,140,112	27,670,841	+11,469,271
GEORGIA.						
Barley	549	1,439	−890	6,053	18,662	−12,609
Buckwheat	319	58	+261	3,527	402	+3,125
Corn	2,582,316	2,538,733	+43,583	29,261,422	23,202,018	+6,059,404
Oats	516,879	612,778	−95,899	4,767,456	5,548,743	−781,287
Rye	20,949	25,854	−4,905	87,021	101,716	−14,695
Wheat	196,635	475,684	−279,051	1,095,312	3,159,771	−2,063,459
Total cereals	3,317,645	3,654,546	−336,901	35,321,791	32,031,312	+3,190,479
ALABAMA.						
Barley	201	511	−310	2,002	5,281	−3,279
Buckwheat	352	42	+301	4,622	363	+4,259
Corn	2,127 548	2,055,929	+71,619	30,073,036	25,451,278	+4,621,758
Oats	344,831	324,628	+20,203	3,231,085	3,039,639	+191,446
Rye	2,190	5,764	−3,574	14,618	28,402	−13,784
Wheat	39,641	264,971	−225,330	208,591	1,529,657	−1,321,066
Total cereals	2,514,763	2,651,845	−137,082	33,533 954	30,054,620	+3,479,334
N. ENGLAND.						
Barley	35,754	29,580	+6,174	871,872	697,884	+173,988
Buckwheat	45,461	59,272	−13,811	890,428	1,039,343	−148,915
Corn	158,701	243,102	−84,401	6,126,046	8,376,308	−2,250,262
Oats	292,219	270,743	+21,476	8,960,323	8,845,681	+114,642
Rye	33,056	64,428	−31,372	403,525	730,215	−326,690
Wheat	15,106	79,003	−63,897	289,124	1,227,037	−937,913
Total cereals	580,297	746,128	−165,831	17,541,318	20,916,468	−3,375,150

Other Crops.

The Potato Crop is still further reduced in condition. Returns to the United States Department of Agriculture dated September 1st indicate an average condition for the whole United States of 74.8, or just 20 points under the condition one year ago at the same date. Two years ago, on September 1, 1890, condition was 65.7. Acreage is about the same this year as it was in 1890, the great crop and low prices of last season having caused a reduction in the breadth devoted to this crop. The situation seems to warrant a material reduction from the estimate in our last number of 165,000,000 bushels, and we do not see how the crop can make over 150,000,000 bushels at the outside.

As to Oats, average condition when harvested is stated in the September returns as 78.9 for the whole United States, against 90.7 at the same date last year, and 64.4 on September 1, 1890. The latter condition made an average yield per acre of 19.8 bushels and a total crop of 524 million bushels on 26½ million acres. Last year the high condition, when harvested, made the average yield per acre 28·9 bushels, or a total crop of 738 million bushels on 25½ million acres. The new crop is threshing out so that the yield per acre is expected to average 25½ bushels, or just one bushel under the average of the last decade. With something over 23 million acres in oats, the total cropof 1892 of the United States will be under 620 million bushels.

Progress of the Census.

The complete statistics of cereal production for the whole of the United States as determined by the Eleventh Census taken in June, 1890, are now available in the form of advance census bulletins, or will be by the time this notice reaches the reader. The statistics of sheep and wool are completed but not in print, and considerable progress has been made with the data regarding neat cattle and dairy products. The tabulation of the values of farms, farm implements, live stock, etc., by the Holerith Electric Tabulating system is also going forward. Mr. John Hyde, special agent in charge of the agricultural work of the census, writes: "In a very short time the final results that will be given out will fully account for our silence within the past three weeks." Figures based on actual returns to such an extent that they will prove to be not far from the mark when the final official publications are made, afford the following comparison of the total value of our agricultural industry stated in millions of dollars:

	1860.	1890.	*Increase per cent.*
	Millions of dollars.		
Value of farm lands, buildings and fences	6,645	13,110	97
Value of implements and machinery	246	550	123
Value of live stock	1,089	2,418	122
Value of household furniture,	614	1,680	174
Value of products, sold, consumed and on hand	1,260	3,200	154

Agricultural, Personal and Commercial.

A Salary—With expenses paid, will come handy to any one who is now out of employment, especially where no previous experience is required to get the position. If you want a position, see advertisement on Page 618 headed, "A Chance to Make Money."

American Apples in Europe.—Latest reports from Liverpool, England, show that American apples have arrived this season, so far, in poor condition, owing no doubt largely to the excessive heat which has prevailed during the month of August in the United States as well as in Europe. Sound Gravensteins have sold for $4.85; Holland Pippins, $3.40; and Fall Jennettings, $2.67.

Don't Tobacco Spit Your Life Away is the startling, truthful title of a little book just received, telling all about *Notobac, the wonderful, harmless, economical, guaranteed cure for the tobacco habit in every form.* Tobacco users who want to quit and can't, by mentioning AMERICAN AGRICULTURIST, can get the book mailed free. Address THE STERLING REMEDY CO., Box 754, Indiana Mineral Springs, Ind.

A Foolish Farmer.—Foolish is a mild term to describe the farmer who buys land remote from market. He is working for the railroad company instead of himself. The rich, loamy soil of Michigan produces big crops without any fertilizing, besides being near a big and constant market. A letter to O. M. Barnes, Land Commissioner, Lansing, Mich., will tell you how to get the best of these farms on long time and easy terms.

A Valuable New Wheat.—The Beardless Fulcaster wheat, offered by T. W. Wood & Sons, Richmond, Va., is a decided improvement over the original Bearded Fulcaster, in yield as well as in its milling qualities. Wherever it has been grown it is highly valued and has superseded other kinds. The fall catalogue of this firm, which will be mailed free to all applicants, gives full description of this new wheat, as well as other matters of interest to farmers and gardeners.

Chautauqua in the Army.—A new field of usefulness has recently been opened up to the Chautauqua Circle, in the army posts of the country. A little military publication, "The Army Chaplain," placed part of its columns at the disposal of the C. L. S. C., and it required only a few brief notes on the work of the society to bring to the Buffalo office a host of inquiries from all over the western country. Many of the soldiers in the regular army are bright young men who are capable of making the C. L. S. C. an important factor in their education.

Missouri Literary Exhibits.—The World's Fair Literary Committee (Woman's Work) make an urgent request for every lady writer of Missouri to send a characteristic specimen of her *published* work for the Literary Exhibit. Manuscript not accepted. Send books, magazines or newspapers containing articles, clippings or sketch-books. Work must be sent to the Secretary at earliest possible date; it will be displayed first at the St. Louis Exposition and subsequently be forwarded to Chicago. Inclose stamp for reply. Address: Anna Hinrichs, Secretary, 3132 Lafayette Ave., St. Louis, Mo.

A Quarter of a Million Organs.—At Brattleboro, Vermont, there was recently celebrated an event which stands alone in the history of the

MATTERS OF BUSINESS.

musical and industrial world. In the presence of the Governor and his staff, and of 500 workmen and their families, and many other distinguished citizens, the Estey Organ Company commemorated the completion of the 250,000 organs made by this celebrated house. The joy of the occasion is only equalled by the surpassing excellence of the instruments of music designed by Estey which have made happy, and continue to make happy, so many homes in this broad land.

The Earth is Shrinking.—Sir Edwin Arnold in one of his recent letters says: "This world we live in is becoming sadly monotonous as it shrinks year by year to smaller and smaller dimensions the under rapid movement provided by limited passenger trains and swift ocean steamships."

The New York Central, by the introduction of its Empire State Express, has perhaps to a greater degree than any other force on this continent, aided this shrinking process. It is now possible, by taking this fastest train in the world, to breakfast leisurely at your home or hotel in New York, and dine in Buffalo or Niagara Falls, almost 450 miles away, at your usual hour.

Roofing for Farm Buildings.—The special roofing made by the Philip Carey Mfg. Co., Cincinnati, Ohio, is remarkably well adapted for the roofing of farm buildings. It is as durable as the best shingles, while it costs much less. It is not a cheap inferior grade of roofing put on the market with the expectation of creating a demand on account of its low cost, but is a high grade roofing throughout, and of the very finest quality of materials. It can be easily applied without previous experience, does not unit the rain water for drinking purposes, and is perfectly wind, water and fire proof. Those contemplating the use of roofing will benefit themselves by addressing the company for their catalogue, samples and special prices which they will be glad to furnish to readers of the AMERICAN AGRICULTURIST.

Miss Fanny M. Johnson, known to the readers of the AMERICAN AGRICULTURIST as the author of several charming tales for boys and girls contributed to its columns, including "A Foolish Quarrel," "How Gertrude Learned to Love the Baby," and "Christy and the White Dove," died on August 27th, at the home of a sister in Hinsdale, N. H., aged 47. Serial stories by Miss Johnson were published in the *Youth's Companion* and other periodicals for youth, giving her a national reputation. For the last few years of her life she was literary editor of the *New England Homestead*, published at Springfield, Mass. Miss Johnson's first contributions to the newspapers were made in early life, when she was employed in a mill at Holyoke, Mass., and as the result of indefatigable labor, her talent brought her to the front rank among New England's women of letters.

Managements of Eggs in Incubators.—R. G. Robinson, Co., Florida: Eggs should not be aired or turned after the nineteenth day. The chick turns over completely in the shell at this period and there should be no jarring or change of temperature which always occurs when eggs are sprinkled. On the night of the nineteenth day at the time of turning, several eggs may be tested. If sufficient moisture has been given during incubation one-half of the egg will be opaque and the air cell greatly enlarged. Eggs presenting such an appearance should not be sprinkled. In making the test, should the shell appear filled with the chick, insufficient ventilation and excessive moisture has been given during the three weeks. Eggs thus described usually contain chicks which have died on the seventeenth day. When the eggs begin to chip close the drawer and let it alone until the end of the twentieth day. This of course applies to hot water machines. Hot-air self-regulating incubators have a nursery directly under the hatching tray, to which the chicks may be transferred once a day while hatching, but they should never be removed from the machine until the hatch is over, as it lowers the temperature five degrees for every chick removed.

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Puzzles For Autumn Evenings.

Here we are again. This time the puzzles are not so awfully hard, for we want the members of every family to take hold of them. The prizes are liberal also. For the first best list of answers the prize will be a beautifully decorated parlor lamp; for the second best list of answers, a French Achromatic telescope; third, a plush photograph album; fourth, six plated nut-pickers and nut-cracker; fifth, Stanley's Adventures in Africa.

These prizes will be forwarded, prepaid, to those who send the five *best* lists of answers, and only the five best, and in making the award the manner in which the lists are prepared is considered. If there are ties they are decided by the way in which the lists are prepared, the neatest having the preference. Answers must be mailed on or before the 20th of this month, to "Puzzle Editor," AMERICAN AGRICULTURIST, 52-54 Lafayette Place, New York.

1.—BEHEADINGS.

1. Behead a mark and leave a line, again and leave an atom.
2. Behead a gem and leave tenor, again and leave common.
3. Behead to wince and leave keen, again and leave skill.

2.—WORD SQUARE.

1.—One skilled in dialing; 2, in Spain and Portugal, any son of the King except the eldest; 3, evil Genii in the Mohammeden mythology; 4, bodies of the people not in orders; 5, to denominate; 6, the foremost or aftermost plank in a strake; 7, a token used in Europe.

3.—ABSENT VOWELS.

Thncnqrwmst whnrestsjst, Ndthsbrmtt, "ngdsrtrst!" Ndthstrspngldbnnrntrmphshllwv, Rthlndfthfrndthhmfthbrv.

Supply the missing vowels and name the author.

4.—NUMERICAL ENIGMA.

My 5, 2, 4, a bone in the human body found.
My 3, 8, 1, 6, a fish that in fresh waters abound.
My 9, 7, you'll find is an abbreviation, while my WHOLE is a pleasant recreation.

5.—DELETIONS.

Whole word.

Why this, doth mean my last, you'll find,
Be you and Webster of one mind.

Decapitated.

A species of fungus I am told.
Or, 'tis wood when dead and old.

Curtailed.

Formed by slow process, this must be,
If still with Webster you agree.

Beheaded and Curtailed

Used at one time in different senses
Without regard to moods or tenses.

Total.

If you have *total* don't give in
Until the answer you can win.

Estimating the Value of Commerical Fertilizers.—J. H. Bacon, Richland Co., Illinois: The value of a ton of fertilizer may be found from the chemical analysis placed on the bag or package by the manufacturer, by multiplying the per cent. of each useful ingredient by twenty times the per cent. stated. The present retail values are about eight cents per pound for both soluble and reverted phosphoric acid, three cents for insoluble phosphoric acid, eighteen cents for ammonia and six cents for potassium oxide. If in doubt as to the correctness of the analysis given, send a liberal sample, securely wrapped, to the State fertilizer control which is usually connected with the State experiment station.

Sweet Potatoes and Onions.—Joseph P. Peas, Weber Co., Utah: The conditions required for keeping sweet potatoes and onions over winter are almost directly opposite. Sweet potatoes, in the North, must be stored in a warm and very dry place, while onions require one that is very cool and dry, although considerable moisture will not injure the bulbs if the temperature is low enough to prevent decay. To preserve sweet potatoes, pack them in barrels when thoroughly mature in autumn, discarding all bruised and immature tubers, and, when the barrels are full, pour in kiln-dried sand until all interstices are filled, shaking the barrels a little as the sand is being introduced. Then store in a very dry, warm cellar, or room, where a fire can be built during severe freezing weather, or when there is danger of the potatoes becoming damp during long rains, and airing to get rid of the moisture will be needed. Very dry chaff, or cut straw, may be used in place of sand, but in this case it will be necessary to introduce the packing material as the tubers are put into the barrels. Onions may be stored in almost any outbuilding, or in a dry, cool cellar between layers of straw or chaff, the top layer being covered with straw four to six inches deep, and if left undisturbed until they thaw out in spring, the bulbs will not be injured by even very severe freezing. If wanted for use or market during the winter months, then it is better to store in open barrels, or small bins, and where the temperature will not vary much from the freezing point.

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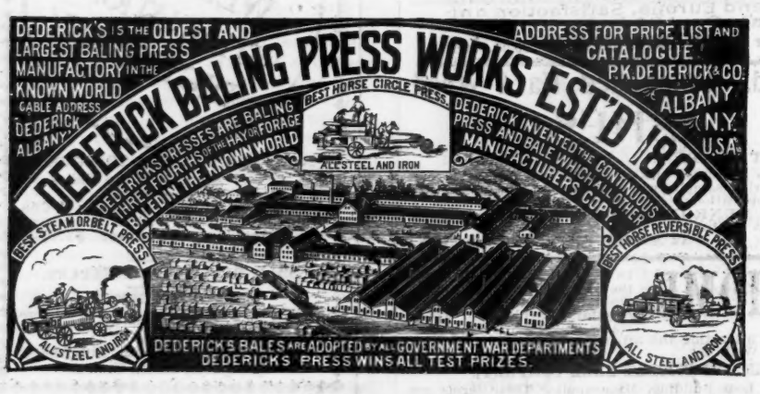
The True Purposes of Experiment Farms.

There is now an experiment station in every State and in nearly every territory in the United States and Canada, yet Director H. P. Armsby says in the forthcoming annual Report of the Pennsylvania station, that much misconception still exists of the true purposes of an agricultural experiment station, and particularly of the experiment farm. The public is learning to look to the laboratories of the stations for scientific investigation into such agricultural problems as cannot be solved by the farmer himself. As regards the farm, however, the idea still more or less distinctly prevails that it should be what is often called a model farm, where can be seen the best variety of farm crops, the most approved methods, the largest crops, the finest buildings, the best stock of all breeds, and not the needed experiments which cost the farmer so much to try.

Another conception of the experiment farm is that of a farm conducted according to the most approved scientific methods and having for its object the securing of an exceptionally large profit. Both these ideas are of value, and a farm conducted upon either plan would be, to a certain extent, an experiment in itself, but both are foreign to the idea of an experiment station, because they preclude other kinds of experiments of much greater importance. A model farm would involve a large first cost for buildings, stock and appliances, and large subsequent expenditures in money and labor for its proper maintenance. As a result, it would be able to show farmers very little which they could not learn from the many estates maintained from private funds and very little which would be of much practical value to the man of limited means, while no funds would be left for any experiments. The conception of a farm conducted for profit seems at first glance very practical, but in reality it is not so. The results obtained on such a farm could, in the nature of things, have only a local and limited application. If they were of value for the grain farmer, they would be of little use to the stockman or dairyman.

An experiment station is chiefly concerned with the scientific principles rather than the art or business of farming; that is, it aims to ascertain and report to the farmer fundamental facts and laws upon which he can safely base his operations. For example, a station would be doing the farmers of a State in general much greater service, by showing them that they can secure forty per cent. more stock food from an acre of corn, by a slightly greater expenditure for seed, than it would by showing to the few who could visit it a model farm, or by the publication of an exceptionally favorable balance sheet. In accordance with this idea, the station farm, like every other department of the station, is regarded primarily as a part of the equipment for experimental purposes. The farm is looked upon as an out-door laboratory, and there is no reason why it should be either a show place or a source of profit, than there is why the chemical laboratory should contain all forms of chemical apparatus in a high state of polish, or should be conducted upon the basis of a commercial laboratory, run for profit. This view controls all the farm operations. Fields are to a considerable extent cut up into small plots, each of which is handled separately. Crops and varieties which are believed to be unprofitable, or not adapted to the locality, are grown for the purpose of definitely ascertaining and demonstrating their profitableness or unprofitableness. Some plats are not manured for years, and others during the same period receive only a partial or one-sided manuring. Much time and labor are expended on feeding experiments, in which the animals make no gain whatever, and are not expected to. Dairy stock are selected and bred with the sole purpose of giving a herd of good dairy cows, which will be available for experiments on milk and butter production.

While experiments in breeding and the comparison of breeds would be of much interest to a comparatively limited number of breeders, the maintaining of even respectable herds of all breeds of dairy cattle, for example (and one breed has as much right to be represented as another), would be a very expensive undertaking, calling for the service of one or more experts for each breed. Even if this could be done by neglecting all other lines of work, it is questionable whether a comparison of breeds, under almost identical conditions, can give any comprehensive idea of the relative value of these breeds. By dropping the question of breeds and breeding entirely, and devoting attention to feeding and dairy problems the station occupies at much less expense, a field which neither the farmer nor the average breeder has time, means or training to cultivate, and may hope to obtain results applicable to all breeds, and of value to all who feed live-stock. In short while the aim is to conduct some general farming carried on by approved methods, and to have the best tools and appliances, the farm is neither a show place nor a money making institution, but an integral part of the organization of an experiment station, devoted primarily to experiment work, and where all other features are subordinated to this aim. This fact should be understood.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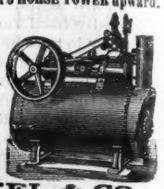

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Main Offices, 52 and 54 Lafayette Place, New York, N. Y.

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